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NSWCDD/TR-92/372



**DESIGN STRUCTURING AND ALLOCATION  
OPTIMIZATION (DESTINATION) PROTOTYPE LEVEL I  
USER'S MANUAL**

**BY MY-HANH N. TRINH AND CUONG M. NGUYEN**

**SYSTEMS RESEARCH AND TECHNOLOGY DEPARTMENT**

**19 OCTOBER 1993**

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**NAVAL SURFACE WARFARE CENTER**

**DAHLGREN DIVISION • WHITE OAK DETACHMENT**

Silver Spring, Maryland 20903-5640

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## FOREWORD

The results presented in this report are part of the Office of Naval Technology's (Code ONT-227) Engineering of Complex Systems (ECS) Technology Block effort. The ECS block was developed to integrate system engineering capabilities for developing large-scale, real-time, computer intensive systems. The goal of the block is to improve the way in which the Navy currently creates, maintains, and improves systems by incorporating state-of-the-art technology and supplying new technology where holes in present methods exist. The block is divided into four projects: Systems Design Synthesis Technology (RS34P11), Systems Evaluation and Assessment Technology (RS34P12), Systems Reengineering Technology (RS34P13), and Engineering Application Prototypes (RS34P14). These projects work closely together to incorporate new technology across the entire system development life cycle.

The System Design Structuring and Allocation Optimization (DESTINATION) task is one of the efforts within the System Design Synthesis Project. The goal of this task is to research, develop, and prototype methodology for optimizing the design of large, complex, real-time systems in a distributed and parallel processing environment. This optimization is performed within the context of design structuring, restructuring, and allocating functional models to resource models to satisfy the desirable measures of effectiveness.

The DESTINATION prototype Level I is a collaborative effort divided among the tasks within the System Design Synthesis Project and among government, business, and academia (including the Naval Surface Warfare Center, Naval Air Warfare Center, Computer Command and Control Company, Trident Systems Incorporated, and University of Illinois).

The DESTINATION Prototype Level I User's Manual is one of the products of the DESTINATION task. The objective of this manual is to help the systems engineers and systems analysts use this prototype. This prototype will continue to be developed. The planned development will include refinement, enhancement, and the incorporation of advanced features through Level III.

The authors would like to thank Steven Howell, Phillip Hwang, and Long Pham for their technical support in preparing this manuscript.

Approved by:

A handwritten signature in cursive script, appearing to read "D. B. Colby".

D. B. COLBY, Head  
Systems Research and Technology  
Department

## ABSTRACT

The objective of the System Design Structuring and Allocation Optimization (DESTINATION) Prototype Level I User's Manual is to help the systems engineers and systems analysts use the DESTINATION prototype Level I effectively. This manual specifies the system's installation requirements, describes the installation procedure, explains each of the menus and commands in the prototype and how to use specific menus and commands; it also gives troubleshooting procedures for handling error messages.

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## CHAPTER 1

### INTRODUCTION

The objective of the System Design Structuring and Allocation Optimization (DESTINATION) task is to research, develop, and prototype a methodology for optimizing the design of large, complex, real-time systems in a distributed and parallel processing environment. This optimization is performed within the context of design structuring, restructuring, and allocating functional models to resource models to meet the system measures of effectiveness.

The concept and methodology portion of the DESTINATION task is described in The DESTINATION Methodology and Capabilities, NSWCDD/TR-92/374 (in publication). Please refer to that report for a detailed description. This user manual will only help the systems engineers and systems analysts use the DESTINATION prototype Level I.

The remainder of this manual is organized as follows: Chapter 2, "DESTINATION Usage," provides installation instructions, descriptions for each of the menus and commands in the prototype, and a guide for the use of specific menus and commands. Chapter 3, "Current Status," provides progress information. Chapter 4, "Future Plans and Directions," describes ongoing research.

If there are any questions on the use of this prototype, please contact:

Cuong M. Nguyen  
Code B44  
Naval Surface Warfare Center  
10901 New Hampshire Avenue  
Silver Spring, MD 20903-5640  
TEL: (301)394-4550  
FAX: (301)394-1175  
EMAIL: cnguyen@relay.nswc.navy.mil



## CHAPTER 2

## DESTINATION USAGE

This chapter provides installation instructions and descriptions for each of the menus and commands in the prototype and guides the user through specific menus and commands.

## 2.1 INSTALLATION ENVIRONMENT REQUIREMENTS

In order to run the DESTINATION prototype Level I version 0.5, the user's environment is required to have the following hardware, software, and operating system:

- \* Platform: Sun4, Sparc I or later
- \* Operating System: Unix Version 4.1.1
- \* Application Software:
  - X Window Version X11R4
  - Motif Version 1.1
  - EPOCH Version 3.2.1

If the environment meets the above requirements, the user performs the following steps to install the DESTINATION tape: (No special procedures are involved except to load the binary file into the directory where the user wants to store the DESTINATION Level I prototype.)

Step 1. Moves to the location where DESTINATION is to be stored.

Example: cd /home/trinh/DESTL1V01

Step 2. Copies the DESTINATION files from the given tape to the current directory as follows:

tar xvf /dev/rst0

Step 3. Inserts a set-environmental command in the user's ".login" file.

setenv WD pathway-of-DESTINATION (e.g., setenv WD /home/trinh/DESTL1V01), where pathway-of-

DESTINATION is the complete pathway from the root directory to the directory where the DESTINATION executable file exists.

- Step 4. Updates the ".login" file by issuing the source command as follows:  
source .login

## 2.2 RUNNING THE DESTINATION PROTOTYPE

To run the DESTINATION prototype, the user goes to the directory where the user has stored it (e.g., cd /home/trinh/DESL1V01), then types:

DESTINATION L1V01 <CR>

The main SYNTHESIS window (Figure 2-1) appears on the screen. It consists of the following pulldown menus: File, Edit, Scenario, Arrange, Utilities, Tutorial, Help, Synthesis Workbench, Design Factors, Model Selection, Extent Selection, Preferences, System Engineering Activity, Resource Allocation Optimization, Design Structuring Optimization, and Optimization Manager. These pulldown menus and their commands are described in the following sections.

## 2.3 USING COMMANDS FROM THE DESTINATION SYNTHESIS MENU

This section describes how to use commands from the DESTINATION Synthesis menu to optimize the design structure and generate a near-optimal allocation of the logical systems functions onto the implementation resources to meet the overall system requirements.

The user is restricted to selecting the [System Engineering Activity] pulldown menu as the first step of operating the SYNTHESIS window. If another button is selected before the [System Engineering Activity] pulldown menu, the selected button will not be activated and the message "This button is not activated unless you select the button [System Engineering Activity] first!" will appear in the "Message" box (see Figure 2-1). This message is acknowledged by clicking on the button [OK] of the "Message" box before proceeding.

### 2.3.1 System Engineering Activity Pulldown Menu

The [System Engineering Activity] (SEA) pulldown menu is meant for guiding the systems engineer or the user throughout various phases of system engineering. By selecting a certain phase, the user can only perform or execute the functions within it.

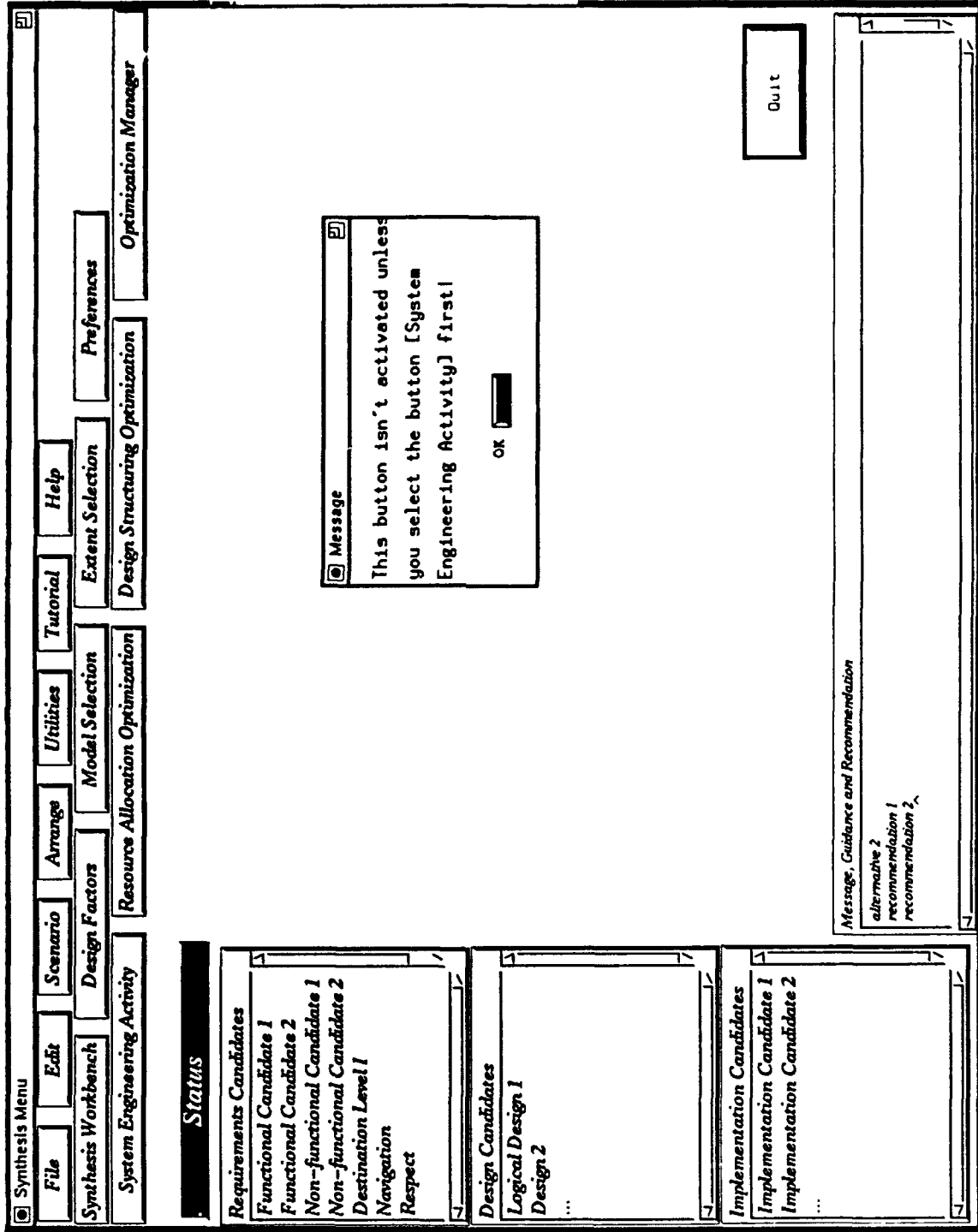


FIGURE 2-1. SYNTHESIS WINDOW AND THE "MESSAGE" BOX

The [System Engineering Activity] pulldown menu consists of the following commands: Requirement, Specify, Capture, Analyze, Design, Simulate, Optimize, Evaluate, Configuration Management, Validation, Verification, Test, and Other. Each of these commands represents a different phase of the system engineering life cycle. When a command is activated, it will allow only a certain operation during that phase to be performed. The commands in this pulldown menu are used both to guide the user throughout the whole system engineering process and simultaneously manage the networking file system for the whole development team.

Any selection of the SEA phase except "Other" will force the user to perform the operation within that selected SEA phase; and any file created within a SEA phase will have a file extension that corresponds to the SEA phase in which it is created. Later, if the user would like to change from one SEA phase to another or from one file extension to another, the user must go back to the [System Engineering Activity] pulldown menu and reselect phase "Other".

The exact capabilities allowed within each phase will be defined in a future version of the user's manual.

#### Requirement Command

This command limits the user to the requirements operation during this phase. It is activated by selecting the [Requirement] menu item from the [System Engineering Activity] pulldown menu.

#### Specify Command

This command limits the user to the specification operation during this phase. It is activated by selecting the [Specify] menu item from the [System Engineering Activity] pulldown menu.

#### Capture Command

This command limits the user to the capture operation during this phase. It is activated by selecting the [Capture] menu item from the [System Engineering Activity] pulldown menu.

#### Analyze Command

This command limits the user to the analyze operation during this phase. It is activated by selecting the [Analyze] menu item from the [System Engineering Activity] pulldown menu.

#### Design Command

This command limits the user to the design operation during this phase. It is activated by selecting the [Design] menu item from the [System Engineering Activity] pulldown menu.

### Simulate Command

This command limits the user to the simulate operation during this phase. It is activated by selecting the [Simulate] menu item from the [System Engineering Activity] pull-down menu.

### Optimize Command

This command limits the user to the optimize operation during this phase. It is activated by selecting the [Optimize] menu item from the [System Engineering Activity] pull-down menu.

### Evaluate Command

This command limits the user to the evaluate operation during this phase. It is activated by selecting the [Evaluate] menu item from the [System Engineering Activity] pull-down menu.

### Configuration Management Command

This command activates a cascade menu with a list of commands to manage the configuration of different types of files during this system development cycle. It is activated by selecting the [Configuration Management] menu item from the [System Engineering Activity] pull-down menu.

### Validation Command

This command limits the user to the validation operation during this phase. It is activated by selecting the [Validation] menu item from the [System Engineering Activity] pull-down menu.

### Verification Command

This command limits the user to the verification operation during this phase. It is activated by selecting the [Verification] menu item from the [System Engineering Activity] pull-down menu.

### Test Command

This command limits the user to the test operation during this phase. It is activated by selecting the [Test] menu item from the [System Engineering Activity] pull-down menu.

### Other Command

This command allows the user to use any operation. It is activated by selecting the [Other] menu item from the [System Engineering Activity] pull-down menu.

## 2.3.2 File Pull-down Menu

The [File] pull-down menu provides commands and utilities for file manipulation. It consists of the following commands: New,

Open, Save, Save As, Rename, Copy, Create Directory, Delete Directory, Print, Delete File, Import, Export, Close, and Quit.

### New Command

The command **New** creates and then opens a new file.

This command is activated by selecting the menu item [New] from the [File] pulldown menu. When this command is activated, a small rectangular outline appears, waiting for the user to click on it. The outline then becomes a solid window with the title "Minibuffer," called the MINIBUFFER window (see Figure 2-2). Below the title bar is a command line that shows the status of the interactive commands and messages and also prompts the user for input and confirmation. For this case, the message is "(New file)." Another larger rectangular outline appears, waiting for the user to click on it. This outline then becomes a solid window with the title "scratch," called the EDITOR window (see Figure 2-2). Below the title bar are work spaces for the user to enter the content of the new file.

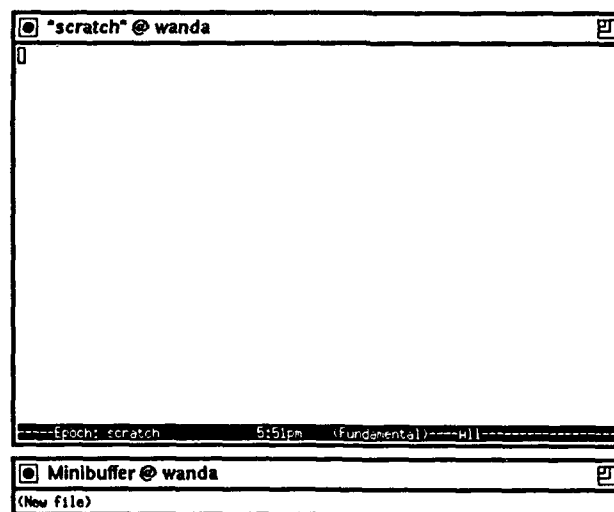


FIGURE 2-2. EDITOR WINDOW AND MINIBUFFER WINDOW

### Open Command

The command **Open** allows the user to open an existing file.

Once the user moves the mouse cursor to the [File] pulldown menu and selects the menu item [Open], the "File and Directory" dialog box appears (see Figure 2-3). The dialog box consists of the following items: (1) the box title "File and Directory," (2) a text label line for displaying messages which, for this case, is "EDIT AN EXISTING FILE," (3) three key-in boxes: path name, file name, and file extension, (4) scroll bars, (5) two scroll

selection lists: files and directories, and (6) two push buttons: [OK] and [QUIT].

By default, the key-in box "Path" displays the pathway-of-DESTINATION; the key-in box "File" displays "\*" for all files; the key-in box "Extension" displays the extension that corresponds to the selected SEA phase; the Files scroll list displays all the files that are located in the default path and also have the default extension; and, finally, the Directories scroll list displays the current directory (./), the parent directory (../), and all the subdirectories under the default path.

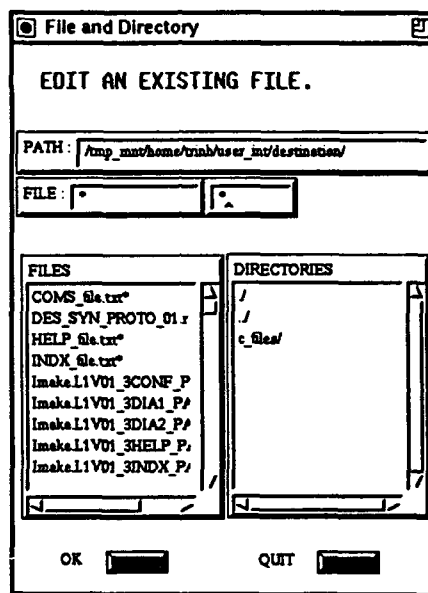


FIGURE 2-3. DEFAULT OF THE "FILE AND DIRECTORY" DIALOG BOX

The user can change the directory either by selecting the new directory name from the Directories scroll list or by editing the key-in box "Path" (see Figure 2-4). However, if the directory is reversed with the intention to pass the root, the message "Sorry, you cannot pass root of the path!" will appear in the "Message" box. This message is acknowledged by clicking on the button [OK] of the "Message" box. The key-in box "File" can also be edited (see Figure 2-4). Any selection of the SEA phase, besides phase "Other," forces the user to perform the operation within that selected SEA phase. Therefore, when the user changes the key-in box "Extension," the "Message" box--with the message "Sorry, you cannot change value of the extension!"--will appear. Again, the "Message" box can be destroyed by clicking on its button [OK]. In order to edit the key-in box "Extension," the user must reselect SEA phase "Other" from the [System Engineering Activity] pulldown menu.

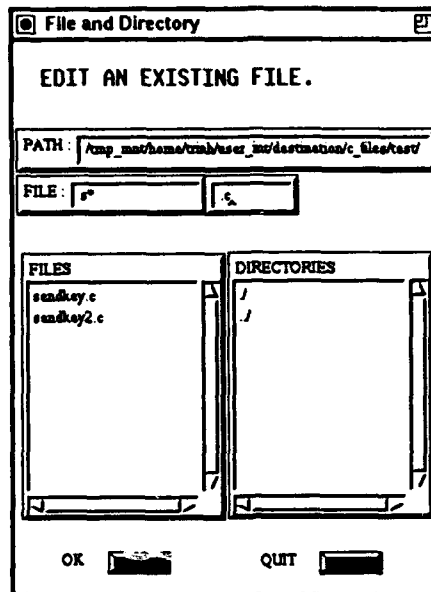


FIGURE 2-4. THE "FILE AND DIRECTORY" DIALOG BOX AFTER A CHANGE BY THE USER

A file to be edited is selected either by entering the filename in the key-in boxes "File" and "Extension" or by choosing a filename from the Files scroll list. Once the file has been selected, the user should click on the button [OK] of the "File and Directory" dialog box. This results in the disappearance of the dialog box. As with the command `New`, the MINIBUFFER window and the EDITOR window will appear, allowing the user to view or edit the file.

#### Save Command

The command `Save` saves the newer version of an existing text file, with the original name the user gave it, and puts it exactly where it came from when the user opened it. The user should use the command `Save` rather than the command `Save As` for routine, periodic saving of a text file.

When the text of an existing file is edited in the EDITOR window, the user selects the menu item [Save] from the [File] pulldown menu. The command line of the MINIBUFFER window will show "Wrote" and the current full pathname and filename.

If, after entering a new text file in the EDITOR window, the user selects the menu item [Save] (instead of the menu item [Save As]) from the [File] pulldown menu by accident, the system will save the new file under the name "scratch." It is strongly recommended that the user rename this file.



### Save As Command

The command **Save As** allows the user to save the text of a new file or an existing file with a new name.

When the text of a new file is entered or the text of an existing file is edited in the EDITOR window, the user selects the menu item [Save As] from the [File] pulldown menu. The command line of the MINIBUFFER window will show "Write file:" and the current full pathname, waiting for the user to edit the desired pathname and the new filename. Once the full pathname and new filename have been entered, the user hits [RETURN] to execute the command.

### Rename Command

The command **Rename** allows the user to rename a file.

After the user moves the mouse cursor to the [File] pulldown menu and selects the menu item [Rename], the "File and Directory" dialog box appears. The description of the "File and Directory" dialog box and its mechanism of operation can be found in subsection "Open" of Section 2.3.2. The user selects a file in any directory to be renamed and then clicks on the button [OK]. This results in the appearance of the "Confirmation" box, which prompts the user for the new filename (see Figure 2-5). Once the new filename has been entered, the user executes the command by clicking on the button [OK] of the "Confirmation" box and leaves the "Confirmation" box by hitting its button [QUIT].

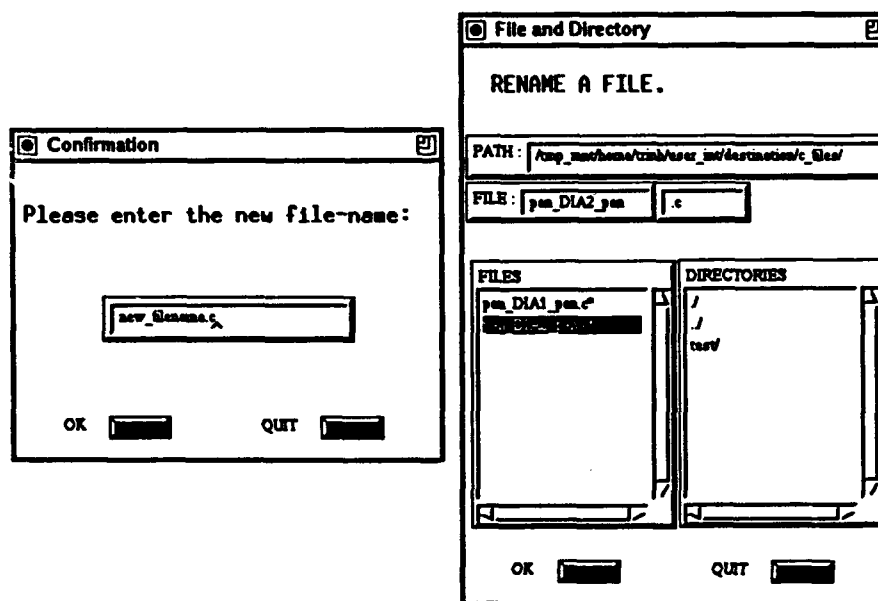


FIGURE 2-5. THE "FILE AND DIRECTORY" DIALOG BOX AND THE "CONFIRMATION" BOX FOR THE COMMAND **Rename**

The displayed "File and Directory" dialog box can be used to check whether the command operated correctly. The user can select another file in any directory and rename or leave the "File and Directory" dialog box by clicking on its button [QUIT].

### Copy Command

The command **Copy** allows the user to copy one or more files from one directory to another directory.

When the menu item [Copy] is selected from the [File] pulldown menu, the "Source and Destination" dialog box with default information appears (see Figure 2-6). Note that the construction of the "Source and Destination" dialog box is based on that of the "File and Directory" dialog box. Therefore, for more information on the description of the "File and Directory" dialog box and its mechanism of operation, see subsection "Open" of Section 2.3.2.

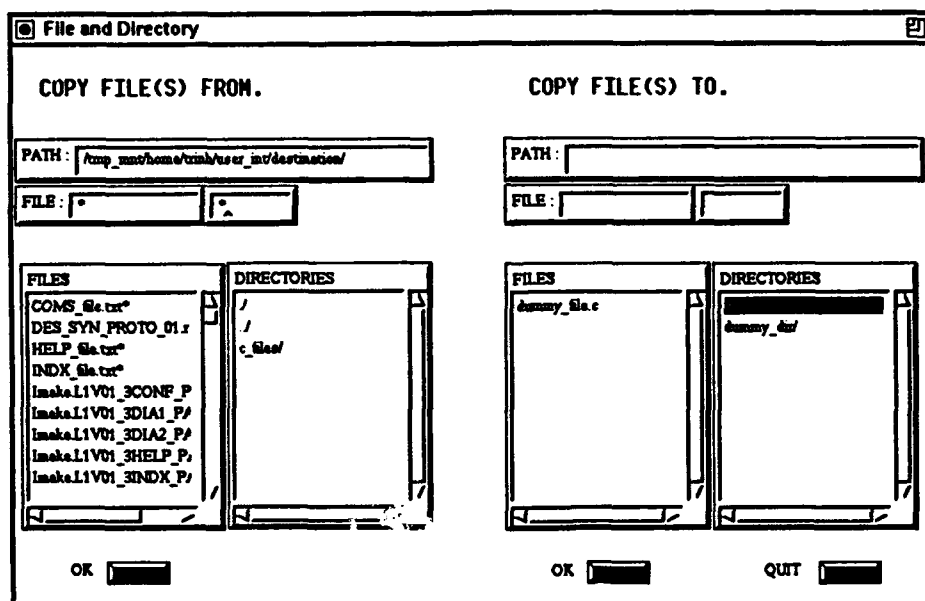


FIGURE 2-6. DEFAULT OF THE "SOURCE AND DESTINATION" DIALOG BOX FOR THE COMMAND **Copy**

The "Source and Destination" dialog box contains two parts: the source information on the left side and the destination information on the right side. On the source part, the user selects one or more files in the desired directory, then clicks on the button [OK] for the source information to be acknowledged and for the destination information to be set to default. On the destination part, the user selects the desired directory, then clicks on the button [OK]. This results in the following sequence: (1) the destination information being acknowledged, (2) the command **Copy** being executed, (3) all files in that directory being displayed for checking purposes, and (4) the

source information being set to default, allowing the user to select other files to copy.

There is a small change in operating the destination part if the user wishes to copy a file under a different name: the user selects the desired directory, types in the new filename and its new extension, and then clicks on the button [OK] (see Figure 2-7).

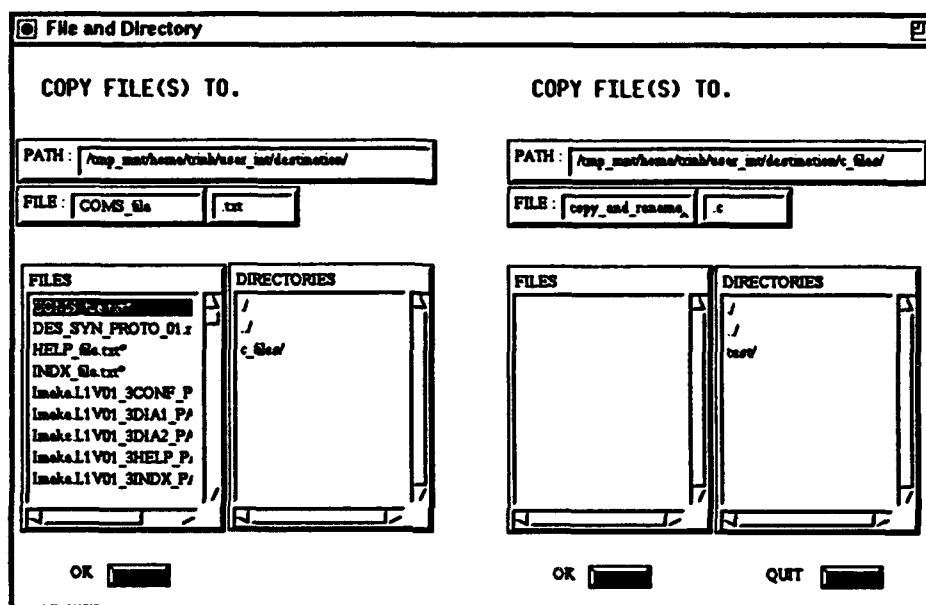


FIGURE 2-7. THE "SOURCE AND DESTINATION" DIALOG BOX WHEN COPYING A FILE UNDER A DIFFERENT NAME

#### Create Directory Command

The command **Create Directory** allows the user to create a new subdirectory.

Once the user moves the mouse cursor to the [File] pulldown menu and selects the menu item [Create Directory], the "File and Directory" dialog box appears. The description of the "File and Directory" dialog box and its mechanism of operation can be found in subsection "Open" of Section 2.3.2. The user selects a directory to create its new subdirectory and then clicks on the button [OK]. This results in the appearance of the "Confirmation" box which prompts the user for the new subdirectory name. Once the new subdirectory name has been entered, the user executes the command by clicking on the button [OK] of the "Confirmation" box and leaves the "Confirmation" box by hitting its button [QUIT].

The displayed "File and Directory" dialog box can be used to check whether the command operated correctly. The user can

select another directory to create its new subdirectory or leave the "File and Directory" dialog box by clicking on its button [QUIT].

### Delete Directory Command

The command **Delete Directory** allows the user to delete a directory.

When the menu item [Delete Directory] is selected from the [File] pulldown menu, the "File and Directory" dialog box appears. The description of the "File and Directory" dialog box and its mechanism of operation can be found in subsection "Open" of Section 2.3.2. The user selects the directory to be deleted and then clicks on the button [OK]. This results in the appearance of the "Confirmation" box, which confirms the deletion of the to-be-deleted directory (see Figure 2-8). The user executes the command by clicking on the button [OK] of the "Confirmation" box and leaves the "Confirmation" box by hitting its button [QUIT].

The key-in box "Path" of the displayed "File and Directory" dialog box can be edited to check whether the command operated correctly. The user can select another directory to delete or leave the "File and Directory" dialog box by clicking on its button [QUIT].

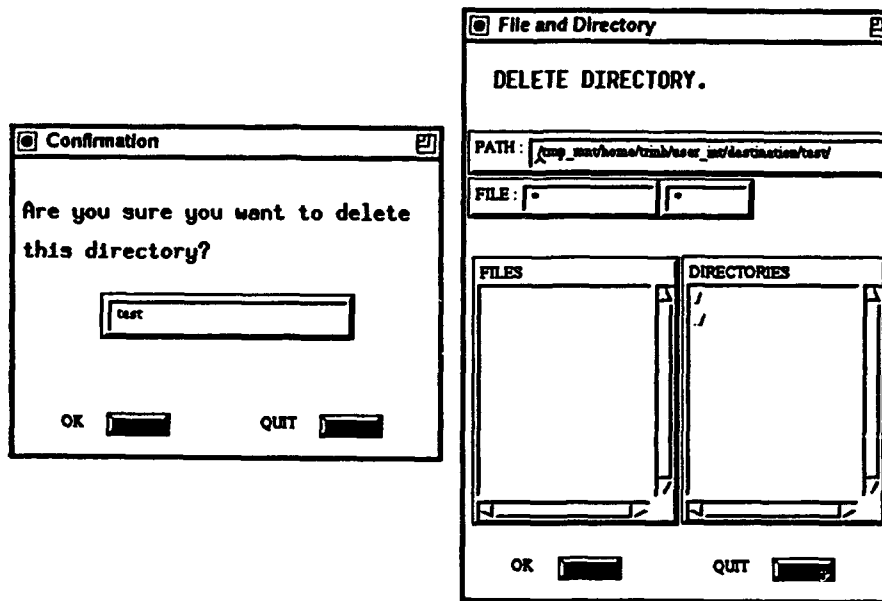


FIGURE 2-8. THE "FILE AND DIRECTORY" DIALOG BOX AND THE "CONFIRMATION" BOX FOR THE COMMAND **Delete Directory**

### Print Command

The command **Print** allows the user to print one or more files.

After the user moves the mouse cursor to the [File] pulldown menu and selects the menu item [Print], the "File and Directory" dialog box appears. The description of the "File and Directory" dialog box and its mechanism of operation can be found in subsection "Open" of Section 2.3.2. After selecting a file or a group of files in any directory to be printed, the user clicks on the button [OK] to execute the command. The user can select other files in other directories to print or leave the "File and Directory" dialog box by clicking on its button [QUIT].

#### Delete File Command

The command **Delete File** allows the user to delete one or more files.

When the menu item [Delete File] is selected from the [File] pulldown menu, the "File and Directory" dialog box appears. The description of the "File and Directory" dialog box and its mechanism of operation can be found in subsection "Open" of Section 2.3.2. After selecting a file or a group of files in any directory to be deleted, the user clicks on the button [OK]. This results in the appearance of the "Confirmation" box, which confirms the deletion of the to-be-deleted file(s). The user executes the command by clicking on the button [OK] of the "Confirmation" box and leaves the "Confirmation" box by hitting its button [QUIT].

The key-in box "File" of the displayed "File and Directory" dialog box can be edited to check whether the command operated correctly. The user can select other files in other directories to delete or leave the "File and Directory" dialog box by clicking on its button [QUIT].

#### Import Command

The command **Import** allows the systems engineer to import a model captured from a commercial CASE tool and simulation tool to the DESTINATION prototype for the optimization. Currently, initial Import capabilities from the Teamwork CASE tool to the DESTINATION prototype have been implemented.

#### Export Command

The command **Export** allows the systems engineer to export a model optimized from the DESTINATION prototype to a commercial CASE tool and simulation tool. Currently, this command has not been implemented.

#### Close Command

The command **Close** closes the text file that the user has viewed or edited in the EDITOR window and then destroys the MINIBUFFER window and the EDITOR window.

In general, after using the command **Save** or **Save As**, the user moves the mouse cursor to the [File] pulldown menu and selects the menu item [Close]. This results in the disappearance of the MINIBUFFER window and the EDITOR window.

The user can also select the menu item [Close] without having to use either the command **Save** or **Save As**. In other words, the menu item [Close] can be selected when the user only needs to view the text (after using command **Open**) or when the user decides neither to save the new text file that has been entered (after using command **New**) nor to save the new version of the text file that has been edited (after using command **Open**).

In this special case, after using the command **New** or **Open**, the user moves the mouse cursor to the [File] pulldown menu and selects the menu item [Close]. The command line of the MINIBUFFER window will show: "Save file," the current full pathname, the filename (if the user is in New mode, the filename will be "scratch"), and "? (y or n)" (see Figure 2-9). To enter "n," the user must move the mouse cursor into either the MINIBUFFER window or the EDITOR window. The command line of the MINIBUFFER window shows: "1 modified buffer exists, do you really want to exit? (yes or no)." Again the user moves the mouse cursor into either the MINIBUFFER window or the EDITOR window in order to enter "yes." This results in the disappearance of the MINIBUFFER window and the EDITOR window. Although the user did not save the text before closing the text, the text will still automatically be saved in the buffer with the new filename formed by enclosing the current filename by the character "#."

```

"scratch" @ wanda

This is a test!

/* =====
 * Handle event from parameter: ok_but
 */
EVENT_HANDLER ok_but_Event (value, count)
  TINTEGER value[]; /* integer vector */
  FUNTIME count; /* run of values */
{
  /* Begin default generated code */

  printf ("Panel HELP_pen, para ok_but: value = %d\n",
          count > 0 ? value[0] : 0);
}

Minibuffer @ wanda
Save file /tmp/.../destination/pen_HELP_pen.c? (y or n)

```

FIGURE 2-9. EDITOR WINDOW AND MINIBUFFER WINDOW FOR THE COMMAND **Close** (WITHOUT EITHER **Save** OR **Save As**)

### Quit Command

The command **Quit** allows the user to leave the application software DESTINATION.

When the user moves the mouse cursor to the [File] pulldown menu and selects the menu item [Quit], the whole application software DESTINATION will stop executing and all DESTINATION windows will be closed.

### 2.3.3 Edit Pulldown Menu

The [Edit] pulldown menu provides the capability to manipulate the contents of a file.

When the [Edit] pulldown menu is selected from the SYNTHESIS window, a list of commands will appear. They are Undo, Redo, Cut, Copy, Paste, Clear, Duplicate, Select All, Font, and Style.

#### Undo Command

The command **Undo** undoes the last text-editing action on a file buffer when the user makes a mistake or changes his mind about some action. Currently, this command has not been implemented.

#### Redo Command

The command **Redo** redoes the last text-editing action on a file buffer. Currently, this command has not been implemented.

#### Cut Command

The command **Cut** removes the selected text from the file buffer and places the text on the cut/paste buffer either to be inserted into the file elsewhere or to be deleted.

In order to use the command **Cut**, the text needs to be marked. The user can mark the text by first placing the pointer on the first character of the text. Then the text is underlined by pressing and holding the left button of the mouse until the text needed to be cut has been marked. Once the text has been marked, the user will move the mouse cursor to the [Edit] pulldown menu and will select the menu item [Cut]. This results in the marked text being removed from the file buffer and being placed into the cut/paste buffer. Note that a Cut causes the cut/paste buffer to be overwritten, thus deleting the prior contents.

#### Copy Command

The command **Copy** copies the selected text from the file buffer into the cut/paste buffer to be inserted into the file elsewhere. The "original" stays where it was when the user selected it.

In order to use the command **Copy**, the text needs to be marked. The user can mark the text by first placing the pointer on the first character of the text. Then the text is underlined by pressing and holding the left button of the mouse until the text needed to be copied has been marked. Once the text has been marked, the user will move the mouse cursor to the [Edit] pulldown menu and will select the menu item [Copy]. This results in the marked text being copied from the file buffer and being placed into the cut/paste buffer. The command **Copy** overwrites any text already in the cut/paste buffer.

#### Paste Command

The command **Paste** retrieves the text that has been stored in the cut/paste buffer by the last **Cut** or **Copy** command.

After using the **Cut** or **Copy** command, the user moves the cursor to the place where the text is to be retrieved and then moves the mouse cursor to the [Edit] pulldown menu and selects the menu item [Paste]. This command allows the user to continue to retrieve text until the user cuts or copies a new selection (which replaces the old contents of the cut/paste buffer).

#### Clear Command

The command **Clear** removes the selected text from the file buffer without placing it on the cut/paste buffer. The contents of the cut/paste buffer (if any) remain intact. Pressing the Delete or Backspace key has the same effect as the command **Clear**. Currently, this command has not been implemented.

#### Duplicate Command

The command **Duplicate** replicates the selected graphical object(s) on the same window. This command can only replicate whole objects. Currently, this command has not been implemented.

#### Select All Command

The command **Select All** selects all textual or graphical objects in the active window. Currently, this command has not been implemented.

#### Font Command

The command **Font** allows the user to set or change the look of the text in the file buffer. Currently, this command has not been implemented.

#### Style Command

The command **Style** allows the user to change the text from one character style to a new style. Currently, this command has not been implemented.



#### 2.3.4 Utilities Pulldown Menu

The [Utilities] pulldown menu provides the utilities to interface with the X window system.

When the [Utilities] pulldown menu is selected from the SYNTHESIS window, a list of commands will appear. They are Refresh Screen, Reset, Console, Windowmgr, Print tool, Administration, and Report Generation.

##### Refresh Screen Command

The command **Refresh Screen** allows the user to repaint all or part of the screen.

After the user moves the mouse cursor to the [Utilities] pulldown menu and selects the menu item [Refresh Screen], the window manager will repaint windows on the screen.

##### Reset Command

The command **Reset** restores the terminal characteristics to their default values.

When the menu item [Reset] is selected from the [Utilities] pulldown menu, the window manager will clear all commands in windows except the Console window.

##### Console Command

The command **Console** opens a new system Console window.

Once the user moves the mouse cursor to the [Utilities] pulldown menu and selects the menu item [Console], a new system Console window will be opened and raised to the top of the screen.

##### Windowmgr Command

The command **Windowmgr** causes the Icon of the window manager to pop up.

When the menu item [Windowmgr] is selected from the [Utilities] pulldown menu, the Icon of the window manager will be raised to the top of the screen.

##### Print Tool Command

The command **Print tool** brings up the OpenWindows' print tool. This command will only work with the operating system of Unix version 4.1. At this point, the application software TAE+ version 5.1 is running only on Unix version 4.0.3. Therefore, this command will not work until TAE+ is updated.

Administration Command

This command provides a cascade menu with a list of commands to manage the programs, projects, personnel, privileges, passwords, networking, databases, interfaces, records and logs, versions, and other miscellaneous administrative functions. This command is not yet available in this version.

Report Generation Command

This command provides a cascade menu with a list of commands to customize the report format, and report manipulation such as list report, merge report, sort report, generate report, bind report, link report, generate program report, generate project report, generate task report, generate component report, generate log report, generate administration report, generate analysis report, generate discrepancy report and generate error report. This command is not yet available in this version.

2.3.5 Help Pulldown Menu

The [Help] pulldown menu provides help information about DESTINATION and its commands. To get help, the user must click on the [Help] pulldown menu from the SYNTHESIS window and a list of help information will appear: About Destination, Index, and Commands.

About Destination Command

The command **About Destination** displays the help information about the DESTINATION prototype Level I version 0.5 user manual.

After the user moves the mouse cursor to the [Help] pulldown menu and selects the menu item [About Destination], the "Help" box appears. The information on the command **About Destination** is scrolled automatically and positioned at the first line of the "Help" box. The user can also scroll through the information in the "Help" box as the user wishes. When the user is done with the "Help" box, he closes it by pressing its button [OK].

Index Command

The command **Index** displays the index list of all the commands used in DESTINATION (unstructured and alphabetical commands; see Figure 2-10), which helps the user to understand a particular command.

When the menu item [Index] is selected from the [Help] pulldown menu, the "Index/Commands" box appears, allowing the user to scroll through the commands in the Index list. After the user selects a particular command for which the user wants help, the "Help" box with help information appears. The information on the command selected from the "Index/Commands" box is scrolled automatically and positioned at the first line of the "Help" box (see Figure 2-10). The user can also scroll through the

information in the "Help" box as the user wishes. When the user is finished with the "Help" box, he closes it by pressing its button [OK] and then leaves the "Index/Commands" box by pressing its button [CLOSE].

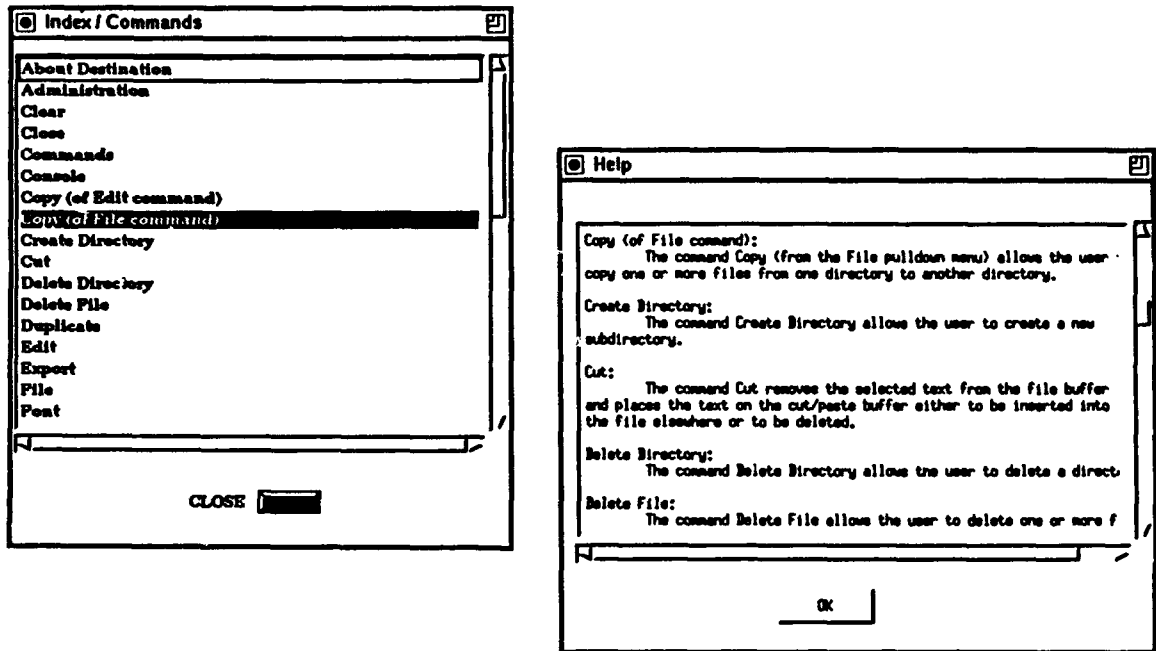


FIGURE 2-10. THE "INDEX/COMMANDS" BOX AND THE "HELP" BOX FOR THE COMMAND Index

### Commands Command

The command **Commands** displays the list of all the commands used in DESTINATION (structured commands; see Figure 2-11) and then helps the user to understand a particular command.

After the user moves the mouse cursor to the [Help] pulldown menu and selects the menu item [Commands], the "Index/Commands" box appears, allowing the user to scroll through the commands in the Commands list. After the user selects a particular command for which the user wants help, the "Help" box with help information appears. The information on the command selected from the "Index/Commands" box is scrolled automatically and positioned at the first line of the "Help" box (see Figure 2-11). The user can also scroll through the information in the "Help" box as the user wishes. When the user is finished with the "Help" box, it is closed by pressing its button [OK]. The "Index/Commands" box is exited by pressing its button [CLOSE].

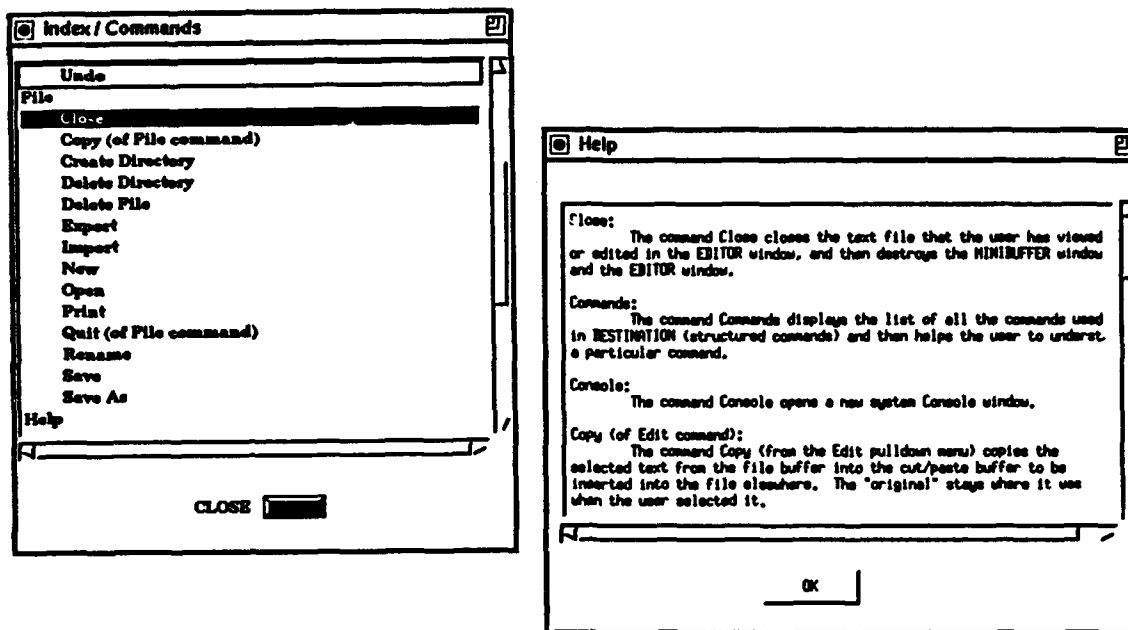


FIGURE 2-11. THE "INDEX/COMMANDS" BOX AND THE "HELP" BOX FOR THE COMMAND Commands

### 2.3.6 Scenario Pulldown Menu

The [Scenario] pulldown menu provides a list of commands to analyze, test, simulate, optimize, and evaluate the system under design during various phases in batch mode and record the results (statistical, deterministic, etc.) in a log file. It also stores the states and the modes of the scenario session to allow incremental analysis. The information collected by this pulldown menu serves as the development life cycle bookkeeping of the different components in different phases by different users. It controls the networking file system for multi-user environment interacting at different phases of the system development cycle. This pulldown menu consists of the following commands: Statistical Log, Create Scenario, Start/Pause/Continue Scenario, Stop Scenario, Save Scenario Mode, Save Scenario State, and Display.

#### Statistical Log Command

This command allows the user to save the statistical analysis result in a file. It is activated by selecting the [Statistical Log] menu item from the [Scenario] pulldown menu. This command is not yet available in this version.

#### Create Scenario Command

This command allows the user to create a file that contains the list of the scenario language commands for batch run

purposes. The scenario language commands contain a list of timing control instructions. The command is activated by selecting the [Create Scenario] menu item from the [Scenario] pulldown menu. This command is not yet available in this version.

#### Start/Pause/Continue Scenario Command

This command toggles among "start," "pause," and "continue" for a specific scenario file. It is activated by selecting the [Start/Pause/Continue Scenario] menu item from the [Scenario] pulldown menu. This command is not yet available in this version.

#### Stop Scenario Command

This command stops a specific scenario file. It is activated by selecting the [Stop Scenario] menu item from the [Scenario] pulldown menu. This command is not yet available in this version.

#### Save Scenario Mode Command

This command stores the current mode of operation of a specific scenario file that is active. This information is used for analyzing the different modes of the system under design. It is activated by selecting the [Save Scenario Mode] menu item from the [Scenario] pulldown menu. This command is not yet available in this version.

#### Save Scenario State Command

This command stores the current state of a specific active scenario file. Its purpose is to incrementally analyze the system under design. It is activated by selecting the [Save Scenario State] menu item from the [Scenario] pulldown menu. This command is not yet available in this version.

#### Display Scenario Command

This command displays the animation (or state by state) of a specific scenario file that is active on the screen. It is activated by selecting the [Display Scenario] menu item from the [Scenario] pulldown menu. This command is not yet available in this version.

### 2.3.7 Arrange Pulldown Menu

The [Arrange] pulldown menu provides a list of commands to manipulate the textual and graphical objects during the design that involves graphics. This pulldown menu consists of the following commands: To Front, To Back, Forward One, Backward One, Group, Ungroup, Align Center, Align Horizontal Center, Align Vertical Center, Align Left, Align Right, Snap to Grid, and Grid Setup.

To Front Command

This command displays the selected object in front of all objects in the current window. It is activated by selecting the [To Front] menu item from the [Arrange] pulldown menu. This command is not yet available in this version.

To Back Command

This command displays the selected object behind all objects in the current window. It is activated by selecting the [To back] menu item from the [Arrange] pulldown menu. This command is not yet available in this version.

Forward One Command

This command displays the selected object in front of one object in the current window. It is activated by selecting the [Forward One] menu item from the [Arrange] pulldown menu. This command is not yet available in this version.

Backward One Command

This command displays the selected object in back of one object in the current window. It is activated by selecting the [Backward One] menu item from the [Arrange] pulldown menu. This command is not yet available in this version.

Group Command

This command merges the selected objects in the current window into a group. It is activated by selecting the [Group] menu item from the [Arrange] pulldown menu. This command is not yet available in this version.

Ungroup Command

This command separates the selected group in the current window into multiple objects. It is activated by selecting the [Ungroup] menu item from the [Arrange] pulldown menu. This command is not yet available in this version.

Align Horizontal Center Command

This command aligns the selected objects in the current window to the center of the window horizontally. It is activated by selecting the [Align Horizontal Center] menu item from the [Arrange] pulldown menu. This command is not yet available in this version.

Align Vertical Center Command

This command aligns the selected objects in the current window to the center of the window vertically. It is activated by selecting the [Align Vertical Center] menu item from the

[Arrange] pulldown menu. This command is not yet available in this version.

#### Align Left Command

This command aligns the selected objects to the left side in the current window. It is activated by selecting the [Align Left] menu item from the [Arrange] pulldown menu. This command is not yet available in this version.

#### Align Right Command

This command aligns the selected objects to the right side in the current window. It is activated by selecting the [Align Right] menu item from the [Arrange] pulldown menu. This command is not yet available in this version.

#### Snap to Grid Command

This command positions the selected objects to the nearest grid mark in the current window. It is activated by selecting the [Snap to Grid] menu item from the [Arrange] pulldown menu. This command is not yet available in this version.

#### Grid Setup Command

This command partitions the grid spacing and activates or deactivates the grid displayed in the current window. It is activated by selecting the [Grid Setup] menu item from the [Arrange] pulldown menu. This command is not yet available in this version.

### 2.3.8 Tutorial Pulldown Menu

This pulldown menu provides a list of commands to give tutorials on various parts of the DESTINATION prototype. It includes some of the commercial-off-the-shelf (COTS) tools and government-off-the-shelf (GOTS) tools. This pulldown menu consists of the following commands: Navigation, DESTINATION, Design Optimization, Resource Allocation, Optimization Manager, Respect, Mimne, Depend, Teamwork, STP, SES, ADAS, ARM, PERTS, Network II.5, and Comet.

#### Navigation Command

This command walks the user through the tutorial on the Navigation prototype. The Navigation is a prototype that will be developed by the Real-time System Design Capture and Analysis effort in the ECS program. It is activated by selecting the [Navigation] menu item from the [Tutorial] pulldown menu. This command is not yet available in this version.

DESTINATION Command

This command walks the user through the tutorial for this prototype. It is activated by selecting the [DESTINATION] menu item from the [Tutorial] pulldown menu. This command is not yet available in this version.

Design Optimization Command

This command walks the user through the tutorial on the Design Optimization Capabilities of this prototype. It is activated by selecting the [Design Optimization] menu item from the [Tutorial] pulldown menu. This command is not yet available in this version.

Resource Allocation Command

This command walks the user through the tutorial on the Resource Allocation Capabilities of this prototype. It is activated by selecting the [Resource Allocation] menu item from the [Tutorial] pulldown menu. This command is not yet available in this version.

Optimization Manager Command

This command walks the user through the tutorial on the Optimization Manager Capabilities of this prototype. It is activated by selecting the [Optimization Manager] menu item from the [Tutorial] pulldown menu. This command is not yet available in this version.

Respect Command

This command walks the user through the tutorial on the Respect prototype. The Respect is a prototype that will be developed by the Real-Time System Requirements and Traceability effort in the ECS program. It is activated by selecting the [Respect] menu item from the [Tutorial] pulldown menu. This command is not yet available in this version.

Mimne Command

This command walks the user through the tutorial on the Mimne prototype. The Mimne is a prototype that will be developed by the System Massively Interconnected Processor Prototype effort in the ECS program. It is activated by selecting the [Mimne] menu item from the [Tutorial] pulldown menu. This command is not yet available in this version.

Depend Command

This command walks the user through the tutorial on the Depend prototype. The Depend is a prototype that will be developed by the Real-Time Dependable System Design effort in the ECS program. It is activated by selecting the [Depend] menu item



from the [Tutorial] pull-down menu. This command is not yet available in this version.

#### Teamwork Command

This command walks the user through the tutorial on the Teamwork CASE tool. Teamwork CASE tool was developed by CADRE Technologies Incorporated. It is activated by selecting the [Teamwork] menu item from the [Tutorial] pull-down menu. This command is not yet available in this version.

#### STP Command

This command walks the user through the tutorial on the Software Through Picture (STP) CASE tool. STP CASE tool was developed by Interactive Development Environment Incorporated. It is activated by selecting the [STP] menu item from the [Tutorial] pull-down menu. This command is not yet available in this version.

#### SES Command

This command walks the user through the tutorial on the Scientific Engineering Software (SES) Workbench. SES workbench was developed by Scientific Engineering Software Incorporated. It is activated by selecting the [SES] menu item from the [Tutorial] pull-down menu. This command is not yet available in this version.

#### ADAS Command

This command walks the user through the tutorial on the Architecture Design Assessment System tool. ADAS simulation tool was developed by Research Triangle Institute (RTI). It is activated by selecting the [ADAS] menu item from the [Tutorial] pull-down menu. This command is not yet available in this version.

#### PERTS Command

This command walks the user through the tutorial on the Prototyping Environment for Real-Time Systems (PERTS) tool. This tool will be developed by the University of Illinois. It is activated by selecting the [PERTS] menu item from the [Tutorial] pull-down menu. This command is not yet available in this version.

#### ARM Command

This command walks the user through the tutorial on the Advanced Real-time Monitor (ARM) tool. This tool was developed by Software Engineering Institute. It is activated by selecting the [ARM] menu item from the [Tutorial] pull-down menu. This command is not yet available in this version.

### Network II.5 Command

This command walks the user through the tutorial on the Network II.5 tool. The Network II.5 simulation tool was developed by CACI Incorporated. It is activated by selecting the [Network II.5] menu item from the [Tutorial] pulldown menu. This command is not yet available in this version.

### Comet Command

This command walks the user through the tutorial on the Comet tool. The Comet simulation tool was developed by CACI Incorporated. It is activated by selecting the [Comet] menu item from the [Tutorial] pulldown menu. This command is not yet available in this version.

## 2.3.9 Synthesis Workbench Pulldown Menu

This [Synthesis Workbench] pulldown menu provides a list of commands to activate the COTS and GOTS tools. This prototype integrates many of the COTS and GOTS tools to utilize its state-of-the-art capabilities in conjunction with optimization capabilities. This pulldown menu consists of the following commands: Navigation, DESTINATION, Design Optimization, Resource Allocation, Optimization Manager, Respect, Mimne, Depend, Teamwork, STP, SES, ADAS, PERTS, ARM, Network II.5, and Comet.

### Navigation Command

This command allows the user to utilize the capabilities developed by the Navigation prototype. It is activated by selecting the [Navigation] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

### DESTINATION Command

This command allows the user to utilize the capabilities developed by the DESTINATION prototype. It is activated by selecting the [DESTINATION] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

### Design Optimization Command

This command allows the user to utilize the capabilities developed by the Design Optimization prototype. It is activated by selecting the [Design Optimization] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

### Resource Allocation Command

This command allows the user to utilize the capabilities developed by the Resource Allocation prototype. It is activated

by selecting the [Resource Allocation] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

#### Optimization Manager Command

This command allows the user to utilize the capabilities developed by the Optimization Manager prototype. It is activated by selecting the [Optimization Manager] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

#### Respect Command

This command allows the user to utilize the capabilities developed by the Respect prototype. It is activated by selecting the [Respect] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

#### Mimne Command

This command allows the user to utilize the capabilities developed by the Mimne prototype. It is activated by selecting the [Mimne] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

#### Depend Command

This command allows the user to utilize the capabilities developed by the Depend prototype. It is activated by selecting the [Depend] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

#### Teamwork Command

This command allows the user to utilize the capabilities developed by the Teamwork CASE tool. It is activated by selecting the [Teamwork] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

#### STP Command

This command allows the user to utilize the capabilities developed by the STP CASE tool. It is activated by selecting the [STP] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

#### SES Command

This command allows the user to utilize the capabilities developed by the SES simulation tool. It is activated by selecting the [SES] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

### ADAS Command

This command allows the user to utilize the capabilities developed by the ADAS simulation tool. It is activated by selecting the [ADAS] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

### PERT Command

This command allows the user to utilize the capabilities developed by the PERTS tool. It is activated by selecting the [PERT] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

### ARM Command

This command allows the user to utilize the capabilities developed by the ARM tool. It is activated by selecting the [ARM] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

### Network II.5 Command

This command allows the user to utilize the capabilities developed by the Network II.5 tool. It is activated by selecting the [Network II.5] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

### Comet Command

This command allows the user to utilize the capabilities developed by the Comet tool. It is activated by selecting the [Comet] menu item from the [Synthesis Workbench] pulldown menu. This command is not yet available in this version.

### 2.3.10 Design Factors Pulldown Menu

The [Design Factors] pulldown menu provides a list of commands and templates to guide the user in the application of System Design Factors (refer to the System Design Factors: The Essential Ingredients of System Design, NSWCDD/TR-92/268 (in publication), for more information). These templates assist the user in specifying the goal/criteria to measure and allow the user to probe this specification to a subsystem, components, an object, or the whole system. The System Design Factors (SDF) provide the mechanism to quantify various aspects of the design. This pulldown menu consists of the following commands: SDF Template, Taxonomy, Performance, Real-Time, Computation/Processing Requirements, Dependability, Security, Humanware, Physical Requirements, Financial Requirements, Time Projected, Life Cycle, and Future Needs Consideration.

### SDF Template Command

This command provides the templates that guide the user in specifying the appropriate goal/criteria that the user wants to measure. It is activated by selecting the [SDF Template] menu item from the [Design Factors] pulldown menu. When this command is activated, the template will appear as shown in Figure 2-12. The SDF features allow the user to specify the design goal/criteria either internally during the DESTINATION prototype session or externally during the Teamwork CASE tool session. In this version, the SDF features are only available for specifying during the Teamwork Case tool session.

### Taxonomy Command

This command provides the taxonomy of the SDF and the detailed description of each factor. The detailed description consists of terminology, definition, source, metrics, example, usage, and note. The terminology provides the commonly used vocabulary word. The definition provides the meaning of the factor. The metrics provide the unit of measurement (dimension) for the factor. The example provides some illustrations of the factor. The usage provides the cases when, how, and why, to apply the factor. Lastly, the note provides the relevant information or warnings related to the factor. This command is activated by selecting the [Taxonomy] menu item from the [Design Factors] pulldown menu. This command is not yet available in this version.

### Performance Command

This command provides the template that guides the user in specifying the Performance goal/criteria that the user wants to measure. It is activated by selecting the [Performance] menu item from the [Design Factors] pulldown menu. When this command is activated, the Performance template will appear as shown in the second template in Figure 2-12. The SDF features allow the user to specify the design goal/criteria either internally, during DESTINATION prototype session, or externally, during the Teamwork CASE tool session. In this version, the SDF features are only available for specifying during the Teamwork Case tool session.

### Real-Time Command

This command provides the template that guides the user in specifying the Real-Time goal/criteria that the user wants to measure. It is activated by selecting the [Real-Time] menu item from the [Design Factors] pulldown menu. When this command is activated, the Real-Time template will appear as shown in the second template in Figure 2-12. The SDF features allow the user to specify the design goal/criteria either internally, during the DESTINATION prototype session, or externally, during the Teamwork CASE tool session. In this version, the SDF features are only available for specifying during the Teamwork Case tool session.

TVM Icon

console

Xtran

memo


memo

LIV01syn

CONF\_pam

SDF\_200

memo



Check appropriate factors to consider

Performance

Security

Life Cycle

Expediency

Finance

Future Needs Consideration

Real-Time

Hardware

Computer/Processing Req.

**System Design Factor value**

Factors	Assigned	priori	Required	value	Actual	value	Assigned	weig	Max	va	in	va	Allowed	req	Accuracy	Other	Details
Performance	7	0.75	0.7	0.0	0.3	0.8	0.6	0.2	0.001								
Dependability	3	4.2	4.0	0.0	0.25	4.9	3.8	0.4	0.001								
Real-Time	1	1.3	1.0	0.0	0.01	1.7	1.0	0.3	0.001								
Physical Req.	2	2.2	2.0	0.0	0.1	2.8	2.5	0.5	0.01								
Security	3	2.3	3.0	0.0	0.15	3.7	2.7	0.4	0.01								
Finance	4	45.0	47.0	0.0	0.1	50.0	30.0	20.0	0.01								
Hardware	2	5.0	4.0	0.0	0.01	7.0	3.0	2.0	0.01								
Time Proj.	3	4.3	4.5	0.0	0.05	5.0	3.0	2.0	0.01								
Life Cycle	5	15.0	14.0	0.0	0.1	17.0	12.0	4.0	0.01								
Comp/Proc Req.	2	1.2	3.2	0.0	0.05	3.3	1.0	3.0	0.01								
Future Needs	2	2.2	4.4	0.0	0.02	4.4	2.7	2.3	0.01								

FIGURE 2-12. SYSTEM DESIGN FACTORS TEMPLATE

TWM Icon

console

Xmain

netio

netio

L1V01sym

SDF\_sel

per\_jan

sof\_3\_jm

SDFP\_sel

rl\_pan

Check appropriate factors to consider

Capacity

Speed

Non-stave Act

Throughput

Response Time

Latency

Graceful Degradation

Efficiency

Predictability

Load Balancing

Relative Act.

Other

System Design SubFactor value

Assigned prior Required value/Attainable value/Actual value Assigned weight/Max value/Allowed reaccuracy Other

Details

Heading

RESET

Subfactors	Assigned	Required	Attainable	Actual	value	Assigned	weight	Max	value	Allowed	reaccuracy	Other
Capability	3	23.0	25.0									
Speed	4	15.0	17.0									
Throughput	8	17.0	28.0									
Response Time	3	32.0	30.0									
Latency	4	1.0	0.9									
Graceful Deg.	2	2.0	2.1									
Efficiency	4	0.8	0.9									
Predictability	6	0.8	0.8									
Load Balancing	7	0.9	0.9									
Relative Act.												
Other												

FIGURE 2-12. SYSTEM DESIGN FACTORS TEMPLATE (CONTINUED)

### Computational/Processing Requirements Command

This command provides the template that guides the user in specifying the Computational/Processing Requirements goal/criteria that the user wants to measure. It is activated by selecting the [Computational/Processing Requirements] menu item from the [Design Factors] pulldown menu. When this command is activated, the **Computational/Processing Requirements** template will appear as shown in the second template in Figure 2-12. The SDF features allow the user to specify the design goal/criteria either internally, during the DESTINATION prototype session, or externally, during the Teamwork CASE tool session. In this version, the SDF features are only available for specifying during the Teamwork Case tool session.

### Dependability Command

This command provides the template that guides the user in specifying the Dependability goal/criteria that the user wants to measure. It is activated by selecting the [Dependability] menu item from the [Design Factors] pulldown menu. When this command is activated, the **Dependability** template will appear as shown in the second template in Figure 2-12. The SDF features allow the user to specify the design goal/criteria either internally, during the DESTINATION prototype session, or externally, during the Teamwork CASE tool session. In this version, the SDF features are only available for specifying during the Teamwork Case tool session.

### Security Command

This command provides the template that guides the user in specifying the Security goal/criteria that the user wants to measure. It is activated by selecting the [Security] menu item from the [Design Factors] pulldown menu. When this command is activated, the **Security** template will appear as shown in the second template in Figure 2-12. The SDF features allow the user to specify the design goal/criteria either internally, during the DESTINATION prototype session, or externally, during the Teamwork CASE tool session. In this version, the SDF features are only available for specifying during the Teamwork Case tool session.

### Humanware Command

This command provides the template that guides the user in specifying the Humanware goal/criteria that the user wants to measure. It is activated by selecting the [Humanware] menu item from the [Design Factors] pulldown menu. When this command is activated, the **Humanware** template will appear as shown in the second template in Figure 2-12. The SDF features allow the user to specify the design goal/criteria either internally, during the DESTINATION prototype session, or externally, during the Teamwork CASE tool session. In this version, the SDF features are only available for specifying during the Teamwork Case tool session.



### Physical Requirements Command

This command provides the template that guides the user in specifying the Physical Requirements goal/criteria that the user wants to measure. It is activated by selecting the [Physical Requirements] menu item from the [Design Factors] pulldown menu. When this command is activated, the **Physical Requirements** template will appear as shown in the second template in Figure 2-12. The SDF features allow the user to specify the design goal/criteria either internally, during the DESTINATION prototype session, or externally, during the Teamwork CASE tool session. In this version, the SDF features are only available for specifying during the Teamwork Case tool session.

### Financial Requirements Command

This command provides the template that guides the user in specifying the Financial Requirements goal/criteria that the user wants to measure. It is activated by selecting the [Financial Requirements] menu item from the [Design Factors] pulldown menu. When this command is activated, the **Financial Requirements** template will appear as shown in the second template in Figure 2-12. The SDF features allow the user to specify the design goal/criteria either internally, during the DESTINATION prototype session, or externally, during the Teamwork CASE tool session. In this version, the SDF features are only available for specifying during the Teamwork Case tool session.

### Time Projected Command

This command provides the template that guides the user in specifying the Time Projected goal/criteria that the user wants to measure. It is activated by selecting the [Time Projected] menu item from the [Design Factors] pulldown menu. When this command is activated, the **Time Projected** template will appear as shown in the second template in Figure 2-12. The SDF features allow the user to specify the design goal/criteria either internally, during the DESTINATION prototype session, or externally, during the Teamwork CASE tool session. In this version, the SDF features are only available for specifying during the Teamwork Case tool session.

### Life Cycle Command

This command provides the template that guides the user in specifying the Life Cycle goal/criteria that the user wants to measure. It is activated by selecting the [Life Cycle] menu item from the [Design Factors] pulldown menu. When this command is activated, the **Life Cycle** template will appear as shown in the second template in Figure 2-12. The SDF features allow the user to specify the design goal/criteria either internally, during the DESTINATION prototype session, or externally, during the Teamwork CASE tool session. In this version, the SDF features are only available for specifying during the Teamwork Case tool session.

### Future Needs Consideration Command

This command provides the template that guides the user in specifying the Future Needs Consideration goal/criteria that the user wants to measure. It is activated by selecting the [Future Needs Consideration] menu item from the [Design Factors] pulldown menu. When this command is activated, the **Future Needs Consideration** template will appear as shown in the second template in Figure 2-12. The SDF features allow the user to specify the design goal/criteria either internally, during the DESTINATION prototype session, or externally, during the Teamwork CASE tool session. In this version, the SDF features are only available for specifying during the Teamwork Case tool session.

#### 2.3.11 Model Selection Pulldown Menu

The [Model Selection] pulldown menu provides a list of model choices to be operated by this prototype. This pulldown menu consists of the following commands: Conceptual, Logical, Resource, and Implementation.

#### Conceptual Model Command

This command instructs the DESTINATION prototype in performing only the operation that relates to the Conceptual Model. It is activated by selecting the [Conceptual Model] menu item from the [Model Selection] pulldown menu. This command is not yet available in this version.

#### Logical Model Command

This command instructs the DESTINATION prototype in performing only the operation that relates to the Logical Model. It is activated by selecting the [Logical Model] menu item from the [Model Selection] pulldown menu. This command is not yet available in this version.

#### Resource Model Command

This command instructs the DESTINATION prototype in performing only the operation that relates to the Resource Model. It is activated by selecting the [Resource Model] menu item from the [Model Selection] pulldown menu. This command is not yet available in this version.

#### Implementation Model Command

This command instructs the DESTINATION prototype in performing only the operation that relates to the Implementation Model. It is activated by selecting the [Implementation Model] menu item from the [Model Selection] pulldown menu. This command is not yet available in this version.

### 2.3.12 Extent Selection Pulldown Menu

The [Extent Selection] pulldown menu provides a list of command choices that select the scope of the system under design. This pulldown menu consists of the following commands: Full Design, Partial Design, By Level, By Name, By Selection, By Selected Area.

#### Full Design Command

This command indicates that the scope of the complete system is under design. It is activated by selecting the [Full Design] menu item from the [Extent Selection] pulldown menu. This command is not yet available in this version.

#### Partial Design Command

This command indicates that the scope of the partial system is under design. It is activated by selecting the [Partial Design] menu item from the [Extent Selection] pulldown menu. This command is not yet available in this version.

#### By Level Command

This command indicates that the scope of the specific level of the system is under design. It is activated by selecting the [By Level] menu item from the [Extent Selection] pulldown menu. This command is not yet available in this version.

#### By Name Command

This command indicates that the scope of the specific component name of the system is under design. It is activated by selecting the [By Name] menu item from the [Extent Selection] pulldown menu. This command is not yet available in this version.

#### By Selection Command

This command indicates that the scope of the selected object(s) of the system is under design. It is activated by selecting the [By Selection] menu item from the [Extent Selection] pulldown menu. This command is not yet available in this version.

#### By Selected Area Command

This command indicates that the scope of the objects in the selected area is under design. It is activated by selecting the [By Selected Area] menu item from the [Extent Selection] pulldown menu. This command is not yet available in this version.

### 2.3.13 Preferences Pulldown Menu

The [Preferences] pulldown menu provides the commands that customize the DESTINATION appearance and modes. This pulldown menu consists of the following commands: Setup Environment and Save Environment.

#### Setup Environment Command

This command provides a cascade menu with a list of commands to allow the user to set up the environment that is suitable to the user when DESTINATION is first started. It is activated by selecting the menu item [Setup Environment] from the [Preferences] pulldown menu. This includes the looks and feels, mode, path, model, etc. This command is not yet available in this version.

#### Save Environment Command

This command allows the user to save the environment when the user completes the customization. It is activated by selecting the menu item [Save Environment] from the [Preferences] pulldown menu. This command is not yet available in this version.

### 2.3.14 Resource Allocation Optimization Pulldown Menu

The [Resource Allocation Optimization] pulldown menu provides a list of commands to perform allocation of the Logical Model onto the Resource Model (refer to the DESTINATION Method and Capabilities for a detailed description). This pulldown menu consists of the following commands: Objective Function Guidance, Allocation Algorithm Guidance, Perform Mapping, Assess Mapping, View Mapping, Display Allocation History, Collect Statistical Results, Generate Report File, Print Statistical Report, Display Algorithm Window, Reset Algorithm Window, Close Algorithm Window, Reconsider All Rejected, Reject From Consideration, Override Selection, Apply Algorithm Selection Rules, Display Assignment Window, Reset Assignment Window, Close Assignment Window, Update Resource Model Utilization, Update Logical Model Utilization, Display Selected Allocation, Display Allocation List, and Tailorable Objective Function Prototype.

#### Objective Function Guidance Command

This command provides the user with a list of objective functions and guides the user in selecting the proper choice based on the design goal/criteria that the user specifies. It is activated by selecting the [Objective Function Guidance] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

### Allocation Algorithm Guidance Command

This command provides the user with a list of allocation algorithms and guides the user in selecting the proper choice based on the design goal/criteria that the user specifies. It is activated by selecting the [Allocation Algorithm Guidance] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

### Perform Mapping Command

This command obtains the selected objective function in conjunction with the selected allocation algorithm and applies to the selected Logical Model and Resource Model for generating the Implementation Model (allocation) candidate. It is activated by selecting the [Perform Mapping] menu item from the [Resource Allocation Optimization] pulldown menu.

### Assess Mapping Command

This command evaluates and ranks the latest generated Implementation Model (allocation) candidate with the previously generated candidates based on the specific design goal/criteria. It is activated by selecting the [Assess Mapping] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

### View Mapping Command

This command graphically displays the selected Logical Model, Resource Model, and Implementation Model (allocation). It is activated by selecting the [View Mapping] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

### Display Allocation History Command

This command displays the lists, ranks, and measures of effectiveness of all the generated Implementation Model (allocations) candidates recorded in the Allocation History file. It is activated by selecting the [Display Allocation History] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

### Collect Statistical Results Command

This command provides a cascade menu with a list of statistical commands to probe and record results of generated Implementation Model (allocation) candidates. It is activated by selecting the [Collect Statistical Results] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

#### Generate Report File Command

This command provides a template to the user for specifying the type of report and information in the report to be generated for the selected Logical Model, Resource Model, and Implementation Model (allocation). It is activated by selecting the [Generate Report File] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

#### Print Statistical Report Command

This command provides a template to the user for specifying the types of reports to be printed for the selected Logical Model, Resource Model, and Implementation Model (allocation). It is activated by selecting the [Print Statistical Report] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

#### Display Algorithm Window Command

This command displays the Algorithm window. It is activated by selecting the [Display Algorithm Window] menu item from the [Resource Allocation Optimization] pulldown menu.

#### Reset Algorithm Window Command

This command resets the Algorithm window to its initial contents. It is activated by selecting the [Reset Algorithm Window] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

#### Close Algorithm Window Command

This command closes the Algorithm window. It is activated by selecting the [Close Algorithm Window] menu item from the [Resource Allocation Optimization] pulldown menu.

#### Reconsider All Rejected Command

This command places the rejected objective functions and the allocation algorithms from the Rejected selection scroll list back to the Consideration selection scroll list. It is activated by selecting the [Reconsider All Rejected] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

#### Reject From Consideration Command

This command places the selected objective functions and selected allocation algorithms from the Consideration selection scroll list to the Rejection selection scroll list. It is activated by selecting the [Reject From Consideration] menu item

from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

#### Override Selection Command

This command allows the user to override the recommended objective function and allocation algorithm. It is activated by selecting the [Override Selection] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

#### Apply Algorithm Selection Rules Command

This command activates the selected classes of algorithm selection rules to reject unsuitable classes of algorithms and determines the most suitable algorithm to optimize the system under design. It is activated by selecting the [Apply Algorithm Selection Rules] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

#### Display Assignment Window Command

This command displays the Logical and Resource model assignment window and allows the user to graphically specify the initial allocation or the allocation's constraint to the selected Logical Model, and Resource Model. It is activated by selecting the [Display Assignment Window] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

#### Reset Assignment Window Command

This command graphically resets the assignment of the Logical and Resource Model to the nonmapping assignment. It is activated by selecting the [Reset Assignment Window] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

#### Close Assignment Window Command

This command closes the assignment window. It is activated by selecting the [Close Assignment Window] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

#### Update Resource Model Utilization Command

This command provides the bar chart update of the Resource Model Utilization. It is activated by selecting the [Update Resource Model Utilization] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

### Update Logical Model Utilization Command

This command provides the bar chart update of the Logical Model Utilization. It is activated by selecting the [Update Logical Model Utilization] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

### Display Selected Allocation Command

This command graphically displays the selected Implementation Model (allocation) candidate. It is activated by selecting the [Display Selected Allocation] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

### Display Allocation List Command

This command provides the list of Implementation Model (allocation) candidates. It is activated by selecting the [Display Allocation List] menu item from the [Resource Allocation Optimization] pulldown menu. This command is not yet available in this version.

### Tailorable Objective Function Prototype Command

This command provides a series of templates (shown in Figure 2-13) and choices that allow the user to customize the single criteria or multicriteria objective function based on the user's specific design goal/criteria or needs. It is activated by selecting the [Tailorable Objective Function Prototype] menu item from the [Resource Allocation Optimization] pulldown menu.

## 2.3.15 Design Structuring Optimization Pulldown Menu

The [Design Structuring Optimization] pulldown menu provides a list of commands to structure the design (refer to the DESTINATION Methodology and Capabilities technical report for a more detailed description). This pulldown menu consists of the following commands: Perform Partition, Perform Fragmentation, Perform Decomposition, Perform Recomposition, and Perform Code Generation.

### Perform Partition Command

This command allows the user to partition the conceptual model into the Logical Model, Resource Model, and Implementation Model. It is activated by selecting the [Perform Partition] menu item from the [Design Structuring Optimization] pulldown menu. This command is not yet available in this version.



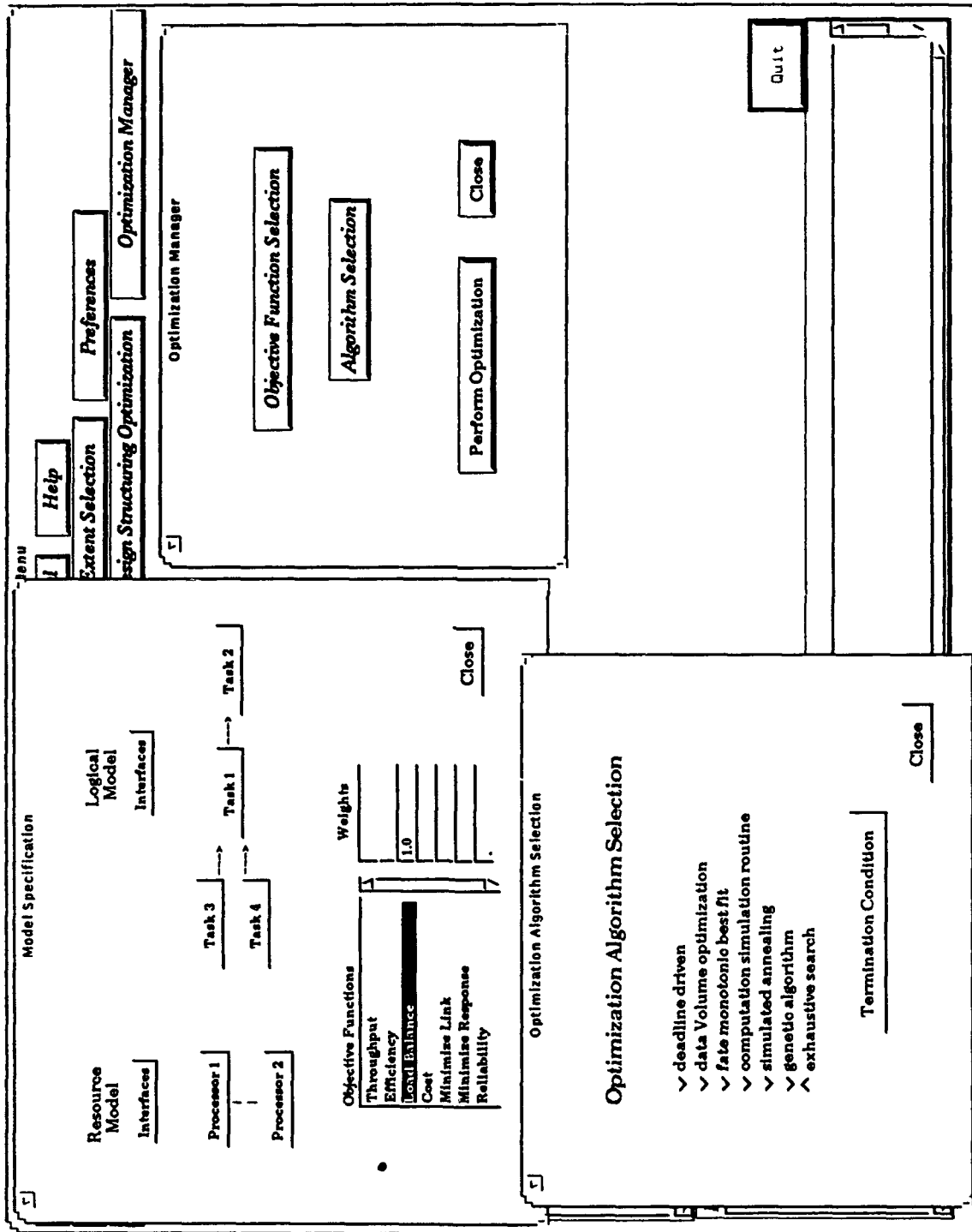


FIGURE 2-13. TAILORABLE OBJECTIVE FUNCTION TEMPLATES

### Perform Fragmentation Command

This command allows the user to fragment a design into multiple designs within the same level of design. It is activated by selecting the [Perform Fragmentation] menu item from the [Design Structuring Optimization] pulldown menu. This command is not yet available in this version.

### Perform Decomposition Command

This command allows the user to decompose one level of design into multiple levels of design. It is activated by selecting the [Perform Decomposition] menu item from the [Design Structuring Optimization] pulldown menu. This command is not yet available in this version.

### Perform Recomposition Command

This command allows the user to recombine multiple levels of design back to one level of design in conjunction with recomposing multiple fragments of the designs back to one design. It is activated by selecting the [Perform Recomposition] menu item from the [Design Structuring Optimization] pulldown menu. This command is not yet available in this version.

### Perform Code Generation Command

This command provides a template that allows the user to select the logical design or logical component and to specify the programming language, programming structure, target machine, and other necessary information for generating code for that particular piece of design. It is activated by selecting the [Perform Code Generation] menu item from the [Design Structuring Optimization] pulldown menu. This command is not yet available in this version.

### 2.3.16 Optimization Manager Pulldown Menu

The [Optimization Manager] pulldown menu provides commands to characterize and quantify the logical, resource, and implementation models (refer to the DESTINATION Methodology and Capabilities for detailed information). It assists the user in making trade-offs and in incorporating design rules into its knowledge base. This pulldown menu consists of the following commands: Reset Characterization Window, Display Characterization Window, Close Characterization Window, Perform Logical Model Quantitative Characterization, Perform Logical Model Qualitative Characterization, Perform Resource Model Quantitative Characterization, Perform Resource Model Qualitative Characterization, Perform Overall Model Quantitative Characterization, Perform Overall Model Qualitative Characterization, Trade-off Analysis, Trade-off Recommendation, Guidance, and Deposit System Design Rules.

### Reset Characterization Window Command

This command resets the value in the characterization window to zero and null. It is activated by selecting the [Reset Characterization Window] menu item from the [Optimization Manager] pulldown menu. This command is not yet available in this version.

### Display Characterization Window Command

This command displays the characterization window. It is activated by selecting the [Display Characterization Window] menu item from the [Optimization Manager] pulldown menu.

### Close Characterization Window Command

This command closes the characterization window. It is activated by selecting the [Close Characterization Window] menu item from the [Optimization Manager] pulldown menu.

### Perform Logical Model Quantitative Characterization Command

This command characterizes the Logical Model quantitatively. It is activated by selecting the [Perform Logical Model Quantitative Characterization] menu item from the [Optimization Manager] pulldown menu. When this command is activated, the Logical Model Quantitative Characterization window appears as shown in Figure 2-14.

### Perform Logical Model Qualitative Characterization Command

This command characterizes the Logical Model qualitatively. It is activated by selecting the [Perform Logical Model Qualitative Characterization] menu item from the [Optimization Manager] pulldown menu. When this command is activated, the Logical Model Qualitative Characterization window will appear as shown in Figure 2-14.

### Perform Resource Model Quantitative Characterization Command

This command characterizes the Resource Model quantitatively. It is activated by selecting the [Perform Resource Model Quantitative Characterization] menu item from the [Optimization Manager] pulldown menu. When this command is activated, the Resource Model Quantitative Characterization window will appear as shown in Figure 2-14.

### Perform Resource Model Qualitative Characterization Command

This command characterizes the Resource Model qualitatively. It is activated by selecting the [Perform Resource Model Qualitative Characterization] menu item from the [Optimization Manager] pulldown menu. When this command is activated, the Resource Model Qualitative Characterization window will appear as shown in Figure 2-14.

Synthesis Menu
File
Edit
Scenario
Arrange
Utilities
Tutorial
Help

Synthesis Workbench
Design Factors
Model Selection
Extent Selection
Preferences

System Engineering Activity
Resource Allocation Optimization
Design Structuring Optimization
Optimization Manager

**Status**

Requirements Candidate

Functional Candidate

Non-functional Candidate

Non-functional Candidate

Destination Level 1

Navigation

Respect

---

Design Candidates

Logical Design 1

Design 2

...

---

Implementation Candidate

Implementation Candidate

Implementation Candidate

...

Overall Model Quantitative

Other	0.000000
Logical Plus Physical Size	35.000000
Complexity	14.500000
Parallelism Value	18.000000

Resource Model Quantitative Value

Number of Nodes	8.000000
Network Complexity Value	70.000000
Connectiveness	64.000000
Other Value	0.000000

Logical Model Quantitative

Number of Software Module	27.000000
Number of Software Processes	54.000000
Module Complexity	14.500000
Parallelism Value	6.000000

Resource Model Characterization

Hard Real-Time Support	moderate
Dependency	low
Parallelism	moderate
Connectiveness	highly
Size	small

Logical Model Characterization

Hard Real-Time Intensity	moderate
Dependency	low
Parallelism	moderate
Module	highly
Size	small

Overall Model Characterization

Complexity	moderate
Dependency	low
Parallelism	low
Physical Support for Logical	moderate
Overall System Size	small

FIGURE 2-14. CHARACTERIZATION WINDOW

### Perform Overall Model Quantitative Characterization Command

This command characterizes the Overall Model quantitatively. It is activated by selecting the [Perform Overall Model Quantitative Characterization] menu item from the [Optimization Manager] pulldown menu. When this command is activated, the Overall Model Quantitative Characterization window will appear as shown in Figure 2-14.

### Perform Overall Model Qualitative Characterization Command

This command characterizes the Overall Model qualitatively. It is activated by selecting the [Perform Overall Model Qualitative Characterization] menu item from the [Optimization Manager] pulldown menu. When this command is activated, the Overall Model Qualitative Characterization window will appear as shown in Figure 2-14.

### Trade-off Analysis

This command provides a cascade menu with a list of commands to allow the user to perform various types of Trade-off Analyses. It is activated by selecting the [Trade-off Analysis] menu item from the [Optimization Manager] pulldown menu. This command is not yet available in this version.

### Trade-off Recommendation

This command provides the user with SDF templates and recommends the user vary certain design goal/criteria or recommends certain design decisions to obtain the optimal solution. It is activated by selecting the [Trade-off Recommendation] menu item from the [Optimization Manager] pulldown menu. This command is not yet available in this version.

### Guidance

This command provides a cascade menu with a list of commands to guide the user from one phase to the next, from one level to the next, or from one component of design to the next. It is activated by selecting the [Guidance] menu item from the [Optimization Manager] pulldown menu. This command is not yet available in this version.

### Deposit System Design Rules

This command allows the user to deposit the design rules into the Design Rules Knowledge Base. The Design Rules are used to enforce the design and the consistency, to verify the correctness, to validate the design, to provide guidance, and to provide recommendations. It is activated by selecting the [Deposit System Design Rules] menu item from the [Optimization Manager] pulldown menu. This command is not yet available in this version.

2.3.17 Quit

The command **Quit** allows the user to leave the application software **DESTINATION**.

When the user clicks on the button [Quit] of the main **SYNTHESIS** window, the whole application software **DESTINATION** will stop executing and all **DESTINATION** windows will be closed.

CHAPTER 3  
CURRENT STATUS

The development of the DESTINATION prototype Level I has been primarily focused on the following areas: DESTINATION Framework and Layout, DESTINATION Interface Specification (DIS), System Design Factors (SDF), Tailorable Objective Function, Initial Resource Allocation Algorithm, Allocation CASE Tool (Teamwork) Interface, Knowledge Base (CLIPS) Interface, other state-of-the-art toolset (ART), and necessary basic building features.

Although the SDF features allow the user to specify the design goal/criteria either internally, during the DESTINATION prototype session, or externally, during the Teamwork CASE tool session, these features are only available for the latter case in the current version.

Although many features have been integrated, the DESTINATION prototype Level I is still far too immature for external or public release. However, the prototype Level I will be available for an ECS internal verification and validation.

## CHAPTER 4

## FUTURE PLANS AND DIRECTIONS

The DESTINATION prototype Level I, version 0.5, is part of the total system design synthesis process. It shows much promise for the optimization of system designs and the identification of system design risks. While this work is being completed, some portions of the prototype have been implemented and tested. Some other portions have not been implemented or have not yet been defined. Due to the lessons learned and the experience gained during the development of this version, the future version will include interfaces to more standardized graphics systems and relational data bases and will have enhanced message-handling capabilities.

The future plan for DESTINATION prototype Level II will include: testing, verification, and validation of prototype Level I for refinement and enhancement. Some of the new features in prototype Level II will include the DESTINATION to Teamwork CASE Export capability, enhanced features of Design Structuring capabilities, enhanced features of the Resource Allocation capabilities, enhanced features of the Optimization Manager, enhanced features of the Tailorable Objective Functions, enhanced features of the Resource Allocation Algorithm, enhanced features of the SDF Specification, initial features of the design rules knowledge base, initial features of the simulation interface, initial features of the Resources Model Capture from Teamwork, and initial integration with PERTS.



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## GLOSSARY

Button--A button item is displayed as a labeled box that is mouse sensitive. Selecting a button will cause a specific action to occur such as displaying another box or performing a process. This action will occur each time the button is selected.

"Confirmation" Box--A box on the screen in which information about directory and file(s) is either displayed or entered. The "Confirmation" box allows the user to either confirm the deletion of a directory or file(s) or enter a new file for renaming purposes. The box consists of the following items: (1) a box title "Confirmation", (2) two text label lines for displaying messages, (3) a key-in box for either directory or file(s), and (4) two push buttons (or simply buttons): [OK] and [QUIT]. See Figure 2-5 in subsection "Rename" and Figure 2-8 in subsection "Delete Directory" of Section 2.3.2.

EPOCH--EPOCH is a modified version of the text editor GNU Emacs software. EPOCH software will create two windows by default, one for the Minibuffer and one for the initial Editor buffer.

"File and Directory" Dialog Box--A box on the screen in which information about path name, file name, and file extension is either displayed or entered. The dialog box allows the user to get into the desired directory and select the desired file(s). The dialog box consists of the following items: (1) a box title "File and Directory;" (2) a text label line for displaying a message; (3) three key-in boxes: path name, file name, and file extension; (4) scroll bars; (5) two scroll selection lists: files and directories; and (6) two push buttons (or simply buttons): [OK] and [QUIT]. See Figure 2-3 in subsection "Open" of Section 2.3.2.

"Help" Box--A box on the screen in which help information about DESTINATION and its commands is displayed only. The box consists of the following items: (1) a box title "Help," (2) a scroll text display for displaying help information, and (3) a push button, [OK]. See Figure 2-10 in subsection "Index" and Figure 2-11 in subsection "Commands" of Section 2.3.5.

## GLOSSARY (Continued)

"Index/Commands" Box--A box on the screen in which a list of all the commands used in DESTINATION is displayed so that the user can select a particular command. The box consists of the following items: (1) a box title, "Index/Commands;" (2) a scroll selection list of all the commands used in DESTINATION; and (3) a push button, [CLOSE]. See Figure 2-10 in subsection "Index" and Figure 2-11 in subsection "Commands" of Section 2.3.5.

Key-in Box--A key-in box item displays a single line of editable text for obtaining data from the user. A key-in box title may be displayed to the left of the key-in box. The user must move the mouse cursor into the key-in box before entering data. Editing is terminated when the user moves the mouse cursor outside of the key-in box, or presses an <enter>.

"Message" Box--A box on the screen in which only a warning message is displayed. The "Message" box is used to notify the user that the user has attempted to do something incorrectly. The box consists of the following items: (1) a box title, "Message;" (2) three text label lines for displaying warning messages; and (3) a push button, [QUIT]. See Figures A-1, A-2, and A-3 in Appendix A.

MOTIF--MOTIF is a library of interface elements that are available to the user.

Pulldown Menu--A pulldown menu is a labeled box which, when selected, causes a menu of choices to be displayed below the box. Each of the choices is called a menu item. A menu item is selected either by dragging the mouse cursor over these choices and then releasing the mouse button at the chosen menu item or by moving the mouse cursor into the chosen menu item and then clicking on it.

Push Button--See Button.

Scroll Bar--Scroll bars allow the user to view data that is too large to be displayed at one time. Most text label items and scroll list items of a box have both a vertical scroll bar for scrolling up and down and a horizontal scroll bar for scrolling from side to side.

Scroll List--A scroll list can be a scrollable list of text choices (scroll selection list) or a scrollable displayed text (scroll text display).

Scroll Selection List--A scroll selection list is a scrollable list of text choices. The user may select a new value for the item by scrolling the list to the desired choice, and then clicking on the chosen item.

GLOSSARY (Continued)

Scroll Text Display--A scroll text display displays large amounts of text in a scrollable box. The user may view the text but may not edit or select it.

"Source and Destination" Dialog Box--A box on the screen in which information about the path name, file name, and file extension of the source part and the destination part is either displayed or entered. The dialog box allows the user to get into the desired directories and select the desired files. The dialog box contains two parts (each part functions in the same way as the "File and Directory" dialog box): the source information on the left side and the destination information on the right side. See Figure 2-7 in subsection "Copy" of Section 2.3.2.

TAE+--TAE+ (Transportable Applications Environment Plus) is an integrated environment for developing and running graphical, window-based application systems.

Text Label--A text label is a nonselectable text that is used for displaying messages only.

Window--Windows occupy sections of the screen and can overlap one another. A window frames its contents. The contents can be buttons, a pulldown menu, or boxes. Most windows can be moved, changed in size, scrolled, and closed.

X Window--X Window (or X) is a network-based windowing system that is independent of the hardware and the operating system. X allows applications to draw pictures as well as text.



## APPENDIX A

## ERROR HANDLING

1. The user is restricted to selecting the [System Engineering Activity] pulldown menu as the first step of operating the SYNTHESIS window. If another button is selected before the [System Engineering Activity] pulldown menu, the selected button will not be activated and the message "This button is not activated unless you select the button [System Engineering Activity] first!" will appear in the "Message" box (see Figure A-1). This message is acknowledged by clicking on the button [OK] of the "Message" box before proceeding.
  
2. The user can change the directory either by selecting the new directory name from the scroll selection list Directories or by editing the key-in box "Path" of the "File and Directory" dialog box or the "Source and Destination" dialog box. However, if the directory is reversed with the intention to pass the root, the message "Sorry, you cannot pass root of the path!" will appear in the "Message" box (see Figure A-2). Again, this message is acknowledged by clicking on the button [OK] of the "Message" box.
  
3. Any selection of SEA phase besides phase "Other" forces the user to perform the operation within that selected SEA phase; and any file created within a SEA phase will have a file extension that corresponds to the SEA phase in which it was created. Therefore, when the user changes the key-in box "Extension," the "Message" box with the message "Sorry, you cannot change value of the extension!" will appear (see Figure A-3). The "Message" box can be destroyed by clicking on its button [OK]. In order to edit the key-in box "Extension," the user must reselect SEA phase "Other" from the [System Engineering Activity] pulldown menu.

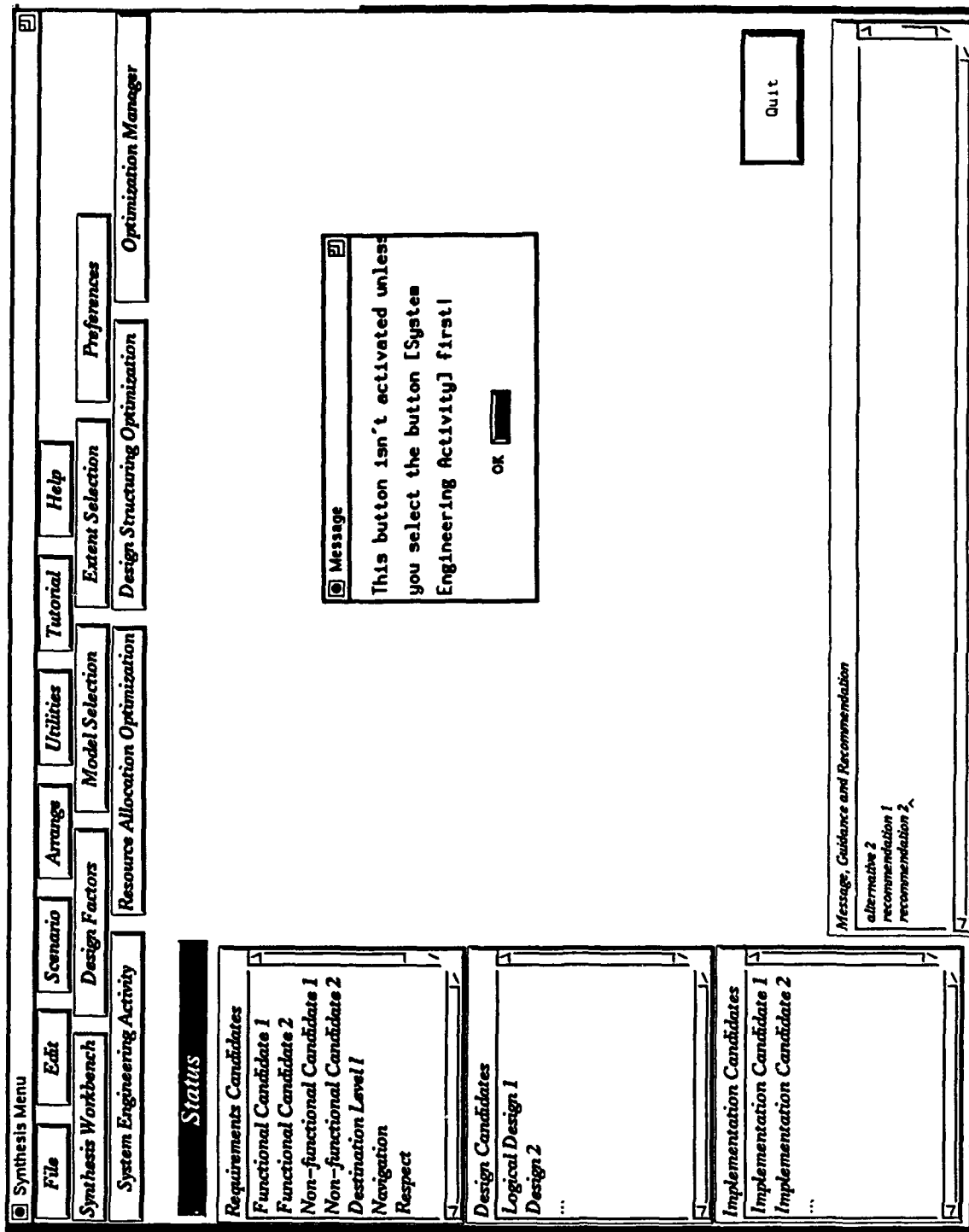


FIGURE A-1. WARNING MESSAGE IF OTHER BUTTON IS SELECTED BEFORE BUTTON [SYSTEM ENGINEERING ACTIVITY]

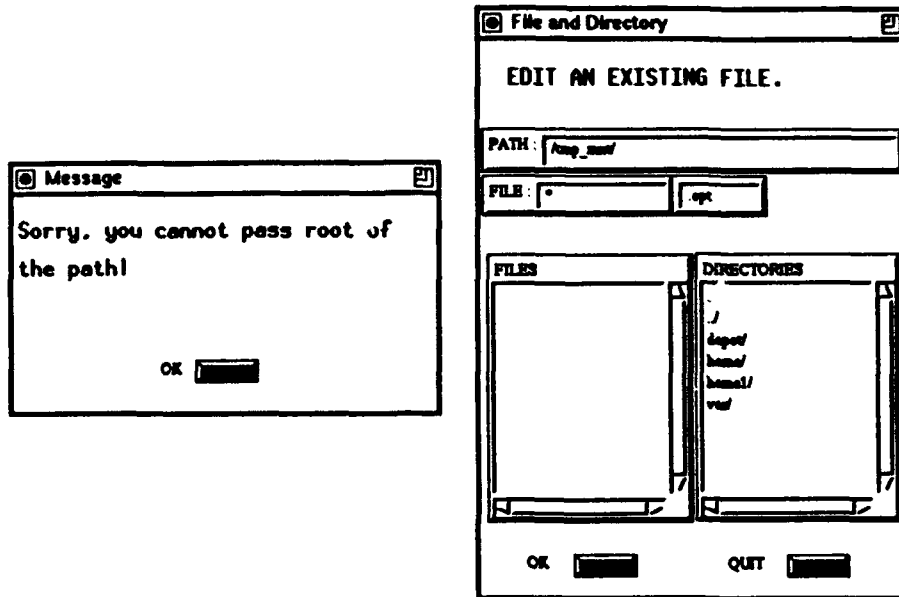


FIGURE A-2. WARNING MESSAGE IF USER INTENDS TO PASS ROOT OF THE PATH

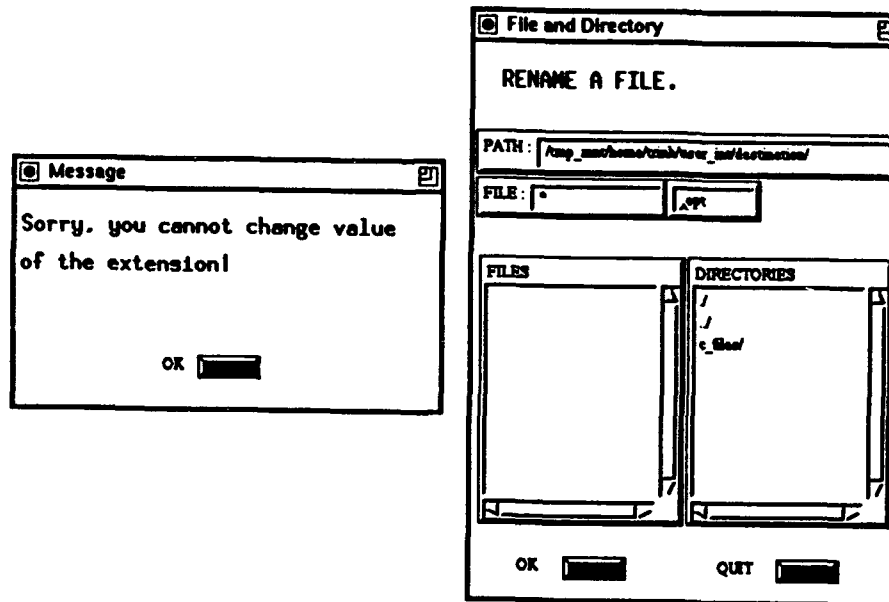


FIGURE A-3. WARNING MESSAGE IF USER CHANGES THE FILE EXTENSION WHILE SEA IS NOT "OTHER"

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<b>1. AGENCY USE ONLY (Leave blank)</b>		<b>2. REPORT DATE</b> 19 October 1993	<b>3. REPORT TYPE AND DATES COVERED</b> Interim, Sep 92 to Oct 93	
<b>4. TITLE AND SUBTITLE</b> DESIGN STRUCTURING AND ALLOCATION OPTIMIZATION (DESTINATION) PROTOTYPE LEVEL I USER'S MANUAL			<b>5. FUNDING NUMBERS</b> 3B6TBA113	
<b>6. AUTHOR(S)</b> My-Hanh N. Trinh and Cuong M. Nguyen				
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> Naval Surface Warfare Center, Dahlgren Division White Oak Detachment 10901 New Hampshire Avenue Silver Spring, MD 20903-5640			<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b> NSWCDD/TR-92/372	
<b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> Office of Naval Research Code ONT-227 800 North Quincy Street Arlington, VA 22217-5000			<b>10. SPONSORING/MONITORING AGENCY REPORT NUMBER</b> -----	
<b>11. SUPPLEMENTARY NOTES</b> -----				
<b>12a. DISTRIBUTION/AVAILABILITY STATEMENT</b> Approved for public release; distribution is unlimited.			<b>12b. DISTRIBUTION CODE</b> -----	
<b>13. ABSTRACT (Maximum 200 words)</b> The objective of the System Design Structuring and Allocation Optimization (DESTINATION) Prototype Level I User's Manual is to help the systems engineers and systems analysts use the DESTINATION prototype Level I effectively. This manual specifies the system's installation requirements, each of the menus and commands in the prototype, and how to use specific menus and commands; it also gives troubleshooting procedures for handling error messages.				
<b>14. SUBJECT TERMS</b> System Design Structuring and Allocation Optimization (DESTINATION), Synthesis, System Design Factors, Objective Function, Mapping, Logical Model, Resource Model, Tradeoff Recommendation			<b>15. NUMBER OF PAGES</b> 72	
			<b>16. PRICE CODE</b> -----	
<b>17. SECURITY CLASSIFICATION OF REPORT</b> UNCLASSIFIED	<b>18. SECURITY CLASSIFICATION OF THIS PAGE</b> UNCLASSIFIED	<b>19. SECURITY CLASSIFICATION OF ABSTRACT</b> UNCLASSIFIED	<b>20. LIMITATION OF ABSTRACT</b> SAR	